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SERVICE MANUAL

Jet X SPORT

S50/R50/SR50

Forward

This service manual contains the technical data of each component inspection and repair for the SANYANG Jet Sport X S50 / R50 / SR50 series scooters.

The manual is shown with illustrations and focused on “Service Procedures”, “Operation Key Points”, and “Inspection Adjustment” so that provides technician with service guidelines.

If the style and construction of the scooters, Jet Sport X S50 / R50 / SR50 series, are different from that of the photos, pictures shown in this manual, the actual vehicle shall prevail. Specifications are subject to change without notice.

Service Department

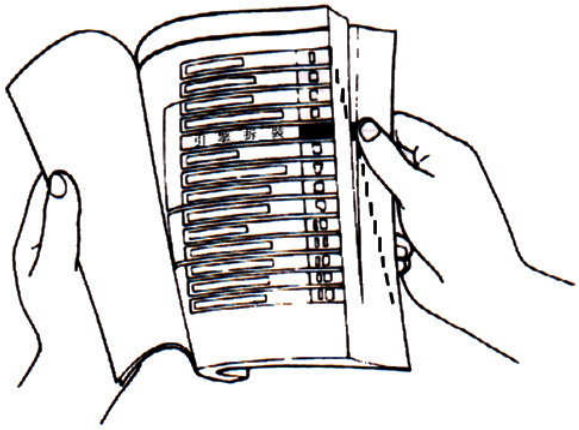
Sanyang Industry Co., LTD.

How to Use This Manual

This service manual describes basic information of different system parts and system inspection & service for SANYANG Jet Sport X S50 / R50 / SR50 series scooters. In addition, please refer to the manual contents in detailed for the model you serviced in inspection and adjustment.

The first chapter covers general information and trouble diagnosis.
The second chapter covers service maintenance information.
The 3rd to the 10th chapters covers engine and driving systems.
The 11th to the 14th chapters is contained the parts set of frame body.
The 15th chapter is electrical equipment.
The 16th chapter is wiring diagram.

Please see index of content for quick having the special parts and system information.



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There are 4 buttons, "**Forward**", "**How to use this manual**", "**Mechanism Illustrations**", and "**Contents**" on the CD-R version, and can be access to these items by click the mouse.
If user wants to look for the content of each chapter, selecting the words of each chapter on the main contents can reach to each chapter. There are two buttons, Back to homepage and Main contents, onto the top line of first page of the each chapter. Thus, if the user needs to check other chapters, he can click the top buttons to back the homepage or main contents. The content of each chapter can be selected too. Therefore, when needs to checking the content inside of the chapter, click the content words of the chapter so that can back to the initial section of the content. In addition, there is a "**This chapter contents**" button at the top line of each page so that clicking the button can back to the contents of this chapter.

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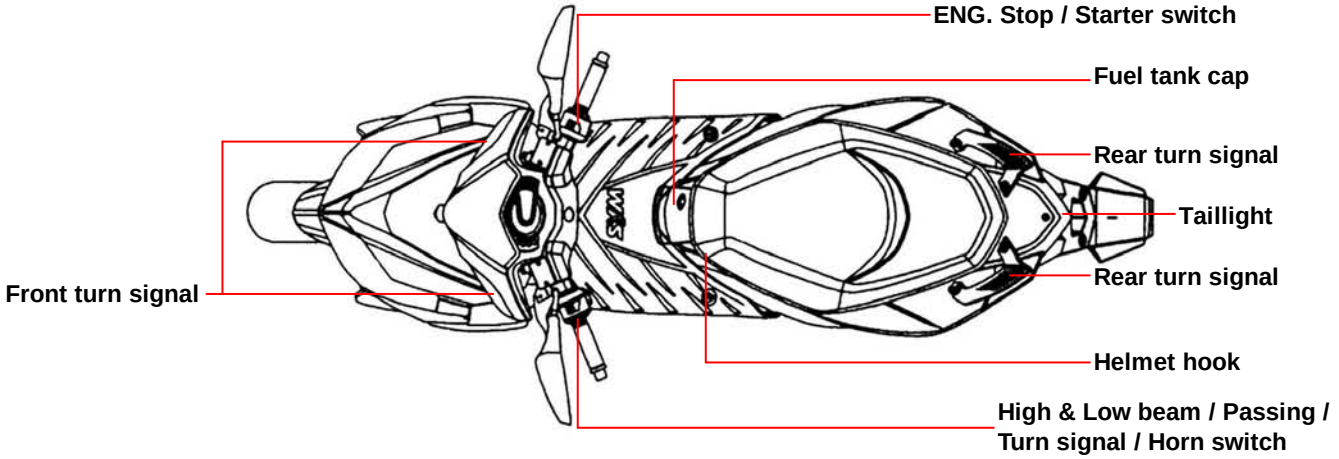
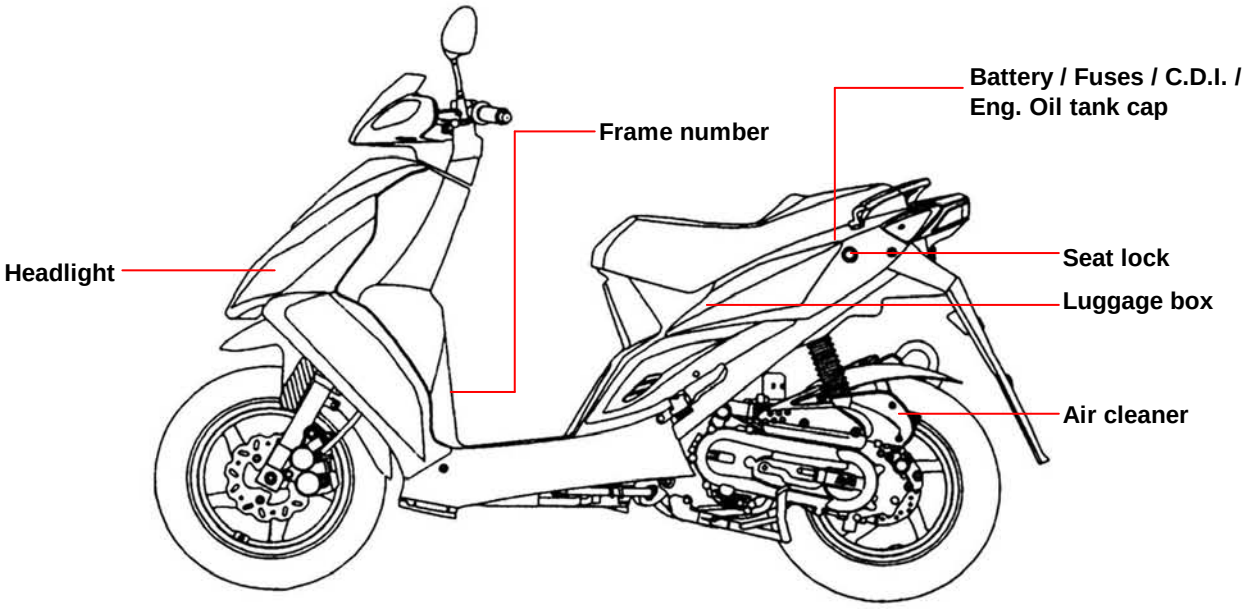
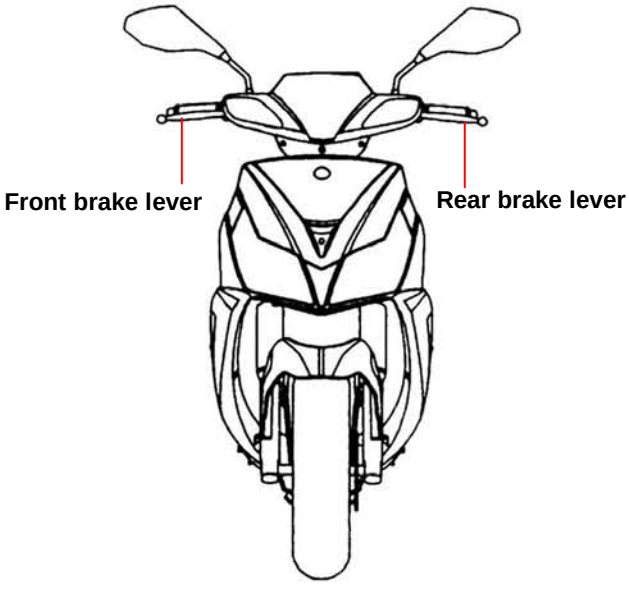
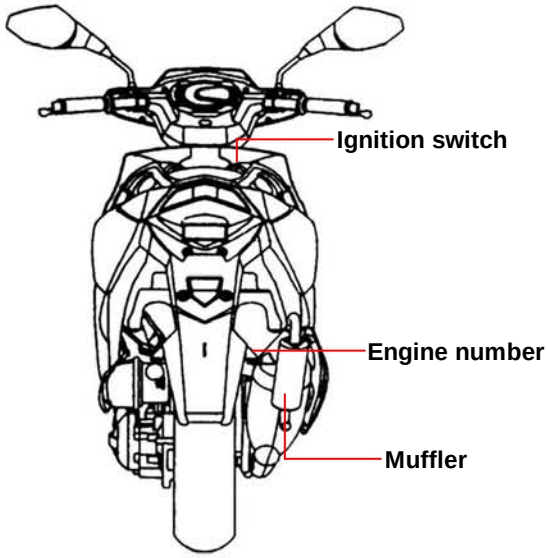
Jet Sport X S50 / R50 / SR50 Series









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Symbols and Marks

Symbols and marks are used in this manual to indicate what and where the special service are needed, in case supplemental information is procedures needed for these symbols and marks, explanations will be added to the text instead of using the symbols or marks.

Warning	Means that serious injury or even death may result if procedures are not followed.
Caution	Means that equipment damages may result if procedures are not followed.
Engine oil	Limits to use SAE 20 JASO FC class oil. Warranty will not cover the damage that caused by not apply with the limited engine oil. (Recommended oil: MAX-2 serial oils)
Grease	King Mate G-3 is recommended.
Gear oil	King Mate gear oil serials are recommended. (Bramax HYPOID GEAR OIL # 140)
Locking sealant	Apply sealant; medium strength sealant should be used unless otherwise specified.
Oil seal	Apply with lubricant.
Renew	Replace with a new part before installation.
Brake fluid	Use recommended brake fluid DOT3 or WELLRUN brake fluid.
Special tools	Special tools.
Correct	Meaning correct installation.
Wrong	Meaning wrong installation.
Indication	Indication of components.
Directions	Indicates position and operation directions.
	Components assembly directions each other.
	Indicates where the bolt installation direction, --- means that bolt cross through the component (invisibility).

General Safety

Carbon monoxide

If you must run your engine, ensure the place is well ventilated. Never run your engine in a closed area. Run your engine in an open area, if you have to run your engine in a closed area, be sure to use an extractor.

⚠ Caution

Exhaust contains toxic gas which may cause one to lose consciousness and even result in death.

Gasoline

Gasoline is a low ignition point and explosive material. Work in a well-ventilated place, no flame or spark should be allowed in the work place or where gasoline is being stored.

⚠ Caution

Gasoline is highly flammable, and may explode under some conditions, keep it away from children.

Used engine oil

⚠ Caution

Prolonged contact with used engine oil (or transmission oil) may cause skin cancer although it might not be verified.

We recommend that you wash your hands with soap and water right after contacting. Keep the used oil beyond reach of children.

Hot components

⚠ Caution

Components of the engine and exhaust system can become extremely hot after engine running. They remain very hot even after the engine has been stopped for some time. When performing service work on these parts, wear insulated gloves and wait until cooling off.

Battery

⚠ Caution

- Battery emits explosive gases; flame is strictly prohibited. Keeps the place well ventilated when charging the battery.
- Battery contains sulfuric acid (electrolyte) which can cause serious burns so be careful do not be spray on your eyes or skin. If you get battery acid on your skin, flush it off immediately with water. If you get battery acid in your eyes, flush it off immediately with water and then go to hospital to see an ophthalmologist.
- If you swallow it by mistake, drink a lot of water or milk, and take some laxative such as castor oil or vegetable oil and then go to see a doctor.
- Keep electrolyte beyond reach of children.

Brake shoe

Do not use an air hose or a dry brush to clean components of the brake system, use a vacuum cleaner or the equivalent to avoid dust flying.

⚠ Caution

Inhaling dust may cause disorders and cancer of the breathing system.

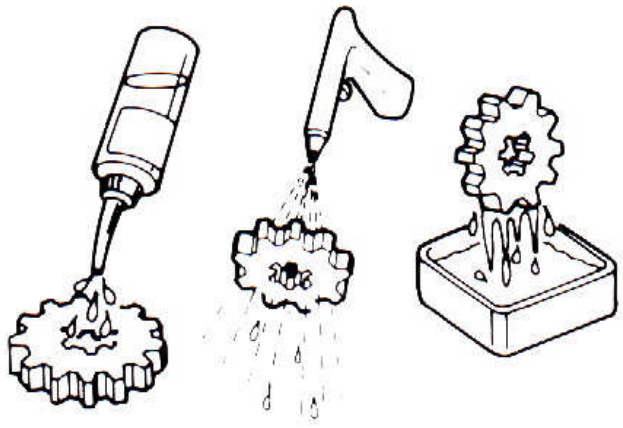
Brake fluid

⚠ Caution

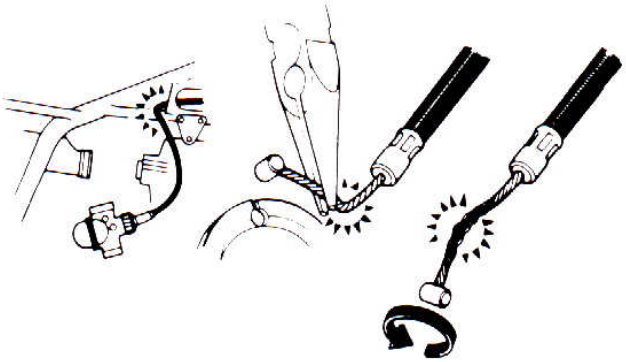
Spilling brake fluid on painted, plastic, or rubber parts may cause damage to the parts. Place a clean towel on the above-mentioned parts for protection when servicing the brake system. Keep the brake fluid beyond reach of children.

Service Precautions

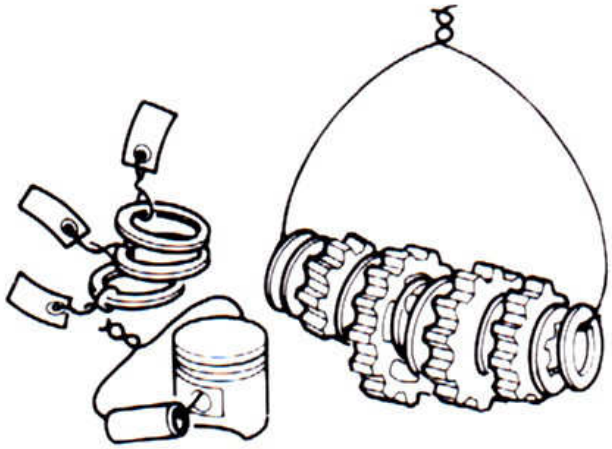
- Always use with SANYANG genuine parts and recommended oils. Using non-designed parts for SANYANG scooter may damage the scooter.
- Special tools are designed for remove and install of components without damaging the parts being worked on. Using wrong tools may result in parts damaged.
- When servicing this scooter, use only metric tools. Metric bolts, nuts, and screws are not interchangeable with the English system, using wrong tools and fasteners may damage this vehicle.
- Clean the outside of the parts or the cover before removing it from the scooter. Otherwise, dirt and deposit accumulated on the part's surface may fall into the engine, chassis, or brake system to cause damage.
- Wash and clean parts with high ignition point solvent, and blow dry with compressed air. Pay special attention to O-rings or oil seals because most cleaning agents have an adverse effect on them.



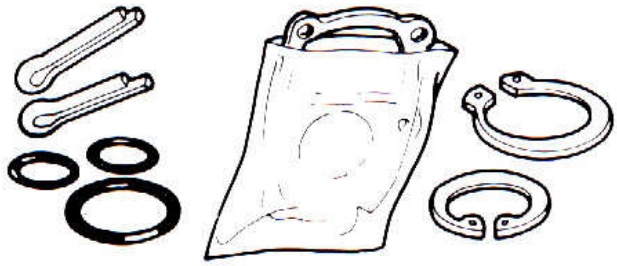
- Never bend or twist a control cable to prevent stiff control and premature worn out.



- Rubber parts may become deteriorated when old, and prone to be damaged by solvent and oil. Check these parts before installation to make sure that they are in good condition, replace if necessary.
- When loosening a component which has different sized fasteners, operate with a diagonal pattern and work from inside out. Loosen the small fasteners first. If the bigger ones are loosen first, small fasteners may receive too much stress.
- Store complex components such as transmission parts in the proper assemble order and tie them together with a wire for ease of installation later.



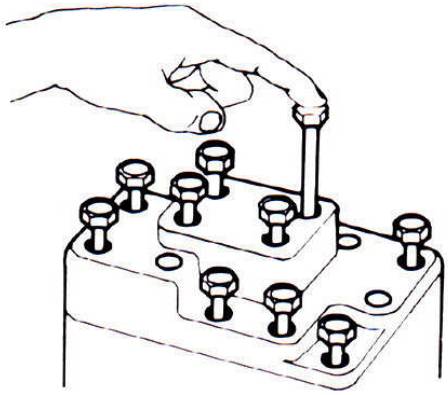
- Note the reassemble position of the important components before disassembling them to ensure they will be reassembled in correct dimensions (depth, distance or position).
- Components not to be reused should be replaced when disassembled including gaskets metal seal rings, O-rings, oil seals, snap rings, and split pins.



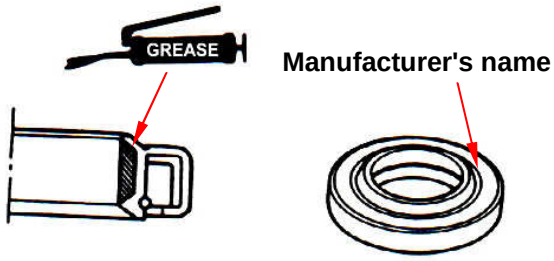
⚠ Caution

In addition to damaging paint finish, brake oil can also damage the structural integration of plastic or rubber parts.

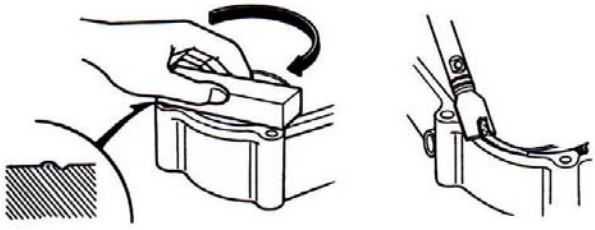
- The length of bolts and screws for assemblies, cover plates or boxes is different from one another, be sure they are correctly installed. In case of confusion, Insert the bolt into the hole to compare its length with other bolts, if its length out side the hole is the same with other bolts, it is a correct bolt. Bolts for the same assembly should have the same length.



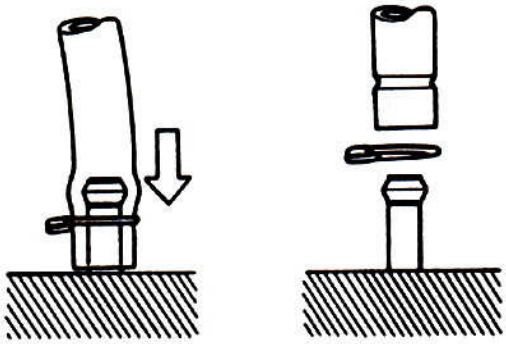
- Tighten assemblies with different dimension fasteners as follows: Tighten all the fasteners with fingers, then tighten the big ones with special tool first diagonally from inside toward outside, important components should be tightened 2 to 3 times with appropriate increments to avoid warp unless otherwise indicated. Bolts and fasteners should be kept clean and dry. Do not apply oil to the threads.
- When oil seal is installed, fill the groove with grease, install the oil seal with the name of the manufacturer facing outside, check the shaft on which the oil seal is to be installed for smoothness and for burrs that may damage the oil seal.



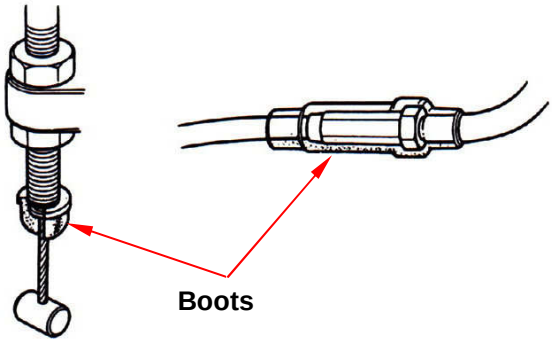
- Remove residues of the old gasket or sealant before reinstallation, grind with a grindstone if the contact surface has any damage.



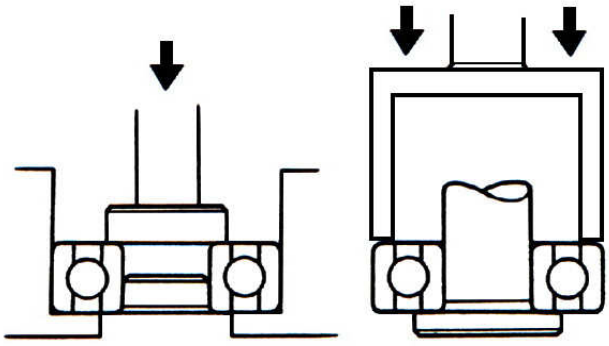
- The ends of rubber hoses (for fuel, vacuum, or coolant) should be pushed as far as they can go to their connections so that there is enough room below the enlarged ends for tightening the clamps.



- Rubber and plastic boots should be properly reinstalled to the original correct positions as designed.



- The tool should be pressed against two (inner and outer) bearing races when removing a ball bearing. Damage may result if the tool is pressed against only one race (either inner race or outer race). In this case, the bearing should be replaced. To avoid damaging the bearing, use equal force on both races.



Both of these examples can result in bearing damage.

- Lubricate the rotation face as assembling. Check if positions and operation for installed parts is in correct and properly.

Specifications

Make			SANYANG	MODEL			Jet Sport X 50 series
Dimension	Overall Length		1840 mm	Suspension System		Front	Telescopic Fork
	Overall Width		690 mm			Rear	Unit Swing
	Overall Height		1120 mm	Tire Specifications		Front	120 / 70 – 12
	Wheel Base		1275 mm			Rear	130 / 70 – 12
Weight	Curb Weight	Front	42 kg	Brake System		Front	Disk (Ø190mm)
		Rear	56 kg			Rear	Disk (Ø160mm)
		Total	98 kg				DRUM (Ø110mm)
	Passengers / Weight		One / 75 kg	Forman Perce	Max. Speed		48 km/hr Below
	Total Weight	Front	64 kg		Climb Ability		22°Below
		Rear	109 kg		Primary Reduction		BELT
		Total	173 kg		Secondary Reduction		GEAR
Engine	Type		Gasoline		Clutch		Centrifugal, dry type
	Installation and arrangement		Horizontal, below center, incline		Transmission		C.V.T.
	Fuel Used		Unleaded (92/95)	Speedometer			0 ~ 80 km/hr
	Cycle/Cooling		2-stroke/forced air cooled	Horn			93 ~ 112 dB/A
	Cylinder	Bore	Ø 39 mm	Muffler			Expansion & Pulse Type
		Stroke	41.4 mm	Exhaust Pipe Position and Direction			Right side, and Backward
		Number/Arrangement	Single Cylinder	Lubrication System			Separated-lubrication
	Displacement		49.4 cc	Exhaust Concentration	CO		1.0 g/km ↓
	Compression Ratio		7.2 : 1				
	Max. HP		2.6 kw / 6000 rpm		HC+Nox		1.2 g/km ↓
	Max. Torque		4.2 Nm / 5500 rpm	E.E.C.			X
	Ignition		C.D.I.	P.C.V.			X
	Starting System		Electrical & kick	Catalytic reaction control system			○

Torque values

Standard Torque Values for Reference

Type	Torque value	Type	Torque value
5 mm Bolt, nut	0.45 ~ 0.6kgf-m	5 mm Screw	0.35 ~ 0.5kgf-m
6 mm Bolt, nut	0.8 ~ 1.2kgf-m	6 mm Screw, flange bolt (SH Type)	0.7 ~ 1.1kgf-m
8 mm Bolt, nut	1.8 ~ 2.5kgf-m	8 mm Flange bolt, nut	1.0 ~ 1.4kgf-m
10 mm Bolt, nut	3.0 ~ 4.0kgf-m	8 mm Flange bolt, nut	2.4 ` 3.0kgf-m
12 mm Bolt, nut	5.0 ~ 6.0kgf-m	10 mm Flange bolt, nut	3.5 ~ 4.5kgf-m

The torque values listed in below table are for more important tighten torque values. Please see above standard values for not listed in the table.

Engine

Item	Q'ty	Thread Dia. (mm)	Torque Value (kgf-m)	Remarks
Cylinder head bolt	**4**	**7**	**1.6~2.0**	When engine cooled
Spark plug	**1**	**14**	**1.1~1.7**	
Inlet pipe nut	**2**	**6**	**0.8~1.2**	
Flywheel nut	**1**	**10**	**3.5~4.5**	
Movable drive face nut	**1**	**12**	**5.5~6.5**	
Drive plate nut	**1**	**28**	**5.0~6.0**	
Clutch outer nut	**1**	**10**	**3.5~4.5**	
Mission oil check bolt	**1**	**10**	**1.0~1.5**	
Mission oil drain bolt	**1**	**8**	**1.0~1.5**	
Mission cover bolt	**7**	**8**	**2.4~3.0**	
Crankcase bolts	**6**	**6**	**1.0~1.5**	
Cooling fan bolts	**4**	**6**	**0.6~1.0**	
Brake shoe anchor pin	**1**	**8**	**1.5~2.0**	
Nuts for exhaust pipe	**2**	**6**	**1.0~1.4**	
Mounting bolts for exhaust	**2**	**8**	**3.0~3.6**	
Others	**-**	**6**	**0.8~1.2**	

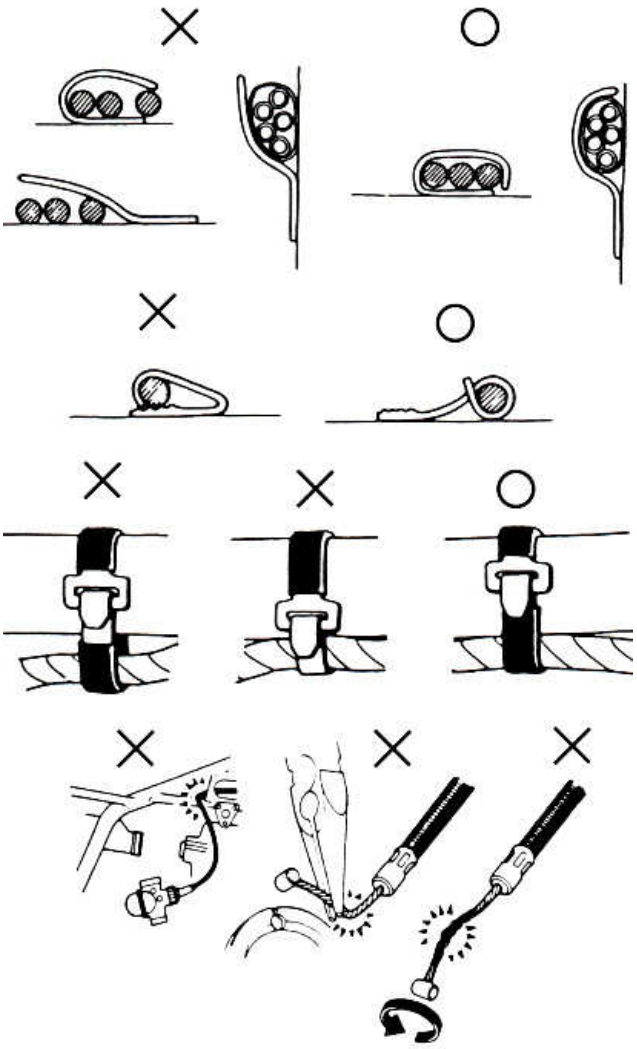
Frame

Item	Q'ty	Thread Dia. (mm)	Torque Value (kgf-m)	Remarks
Mounting nut for handle	1	10	4.0~5.0	
Steering stem lock nut	1	25.4	1.0~2.0	
Steering top cone race	1	25.4	0.2~0.3	
Front cushion bolts	4	8	2.4~3.0	
Front wheel axle nut	1	12	5.0~7.0	
Air cleaner bolts	2	6	1.0~1.4	
Brake master cylinder mounting bolts	4	6	1.0~1.4	
Brake hose bolts	2	10	3.3~3.7	
Brake caliper mounting bolts	2	10	3.1~3.5	
Brake shoe guide bolts	2	6	1.5~2.0	
Brake shoe guide bolts cap	2	6	0.8~1.2	
Brake drain valve	1	6	0.8~1.0	
Mounting bolt for brake disc	7	8	4.0~4.5	
Rear brake arm bolts	1	5	0.8~1.2	
Rear brake lever nuts	2	5	0.8~1.2	
Bolt for engine hanger	4	12	5.5~6.5	
Bolt for engine hanger bracket	1	10	4.5~5.5	
Upper bolt for rear cushion	1	10	3.5~4.5	
Lower bolt for rear cushion	1	8	2.4~3.0	
Rear wheel nut	1	16	10.0~12.0	

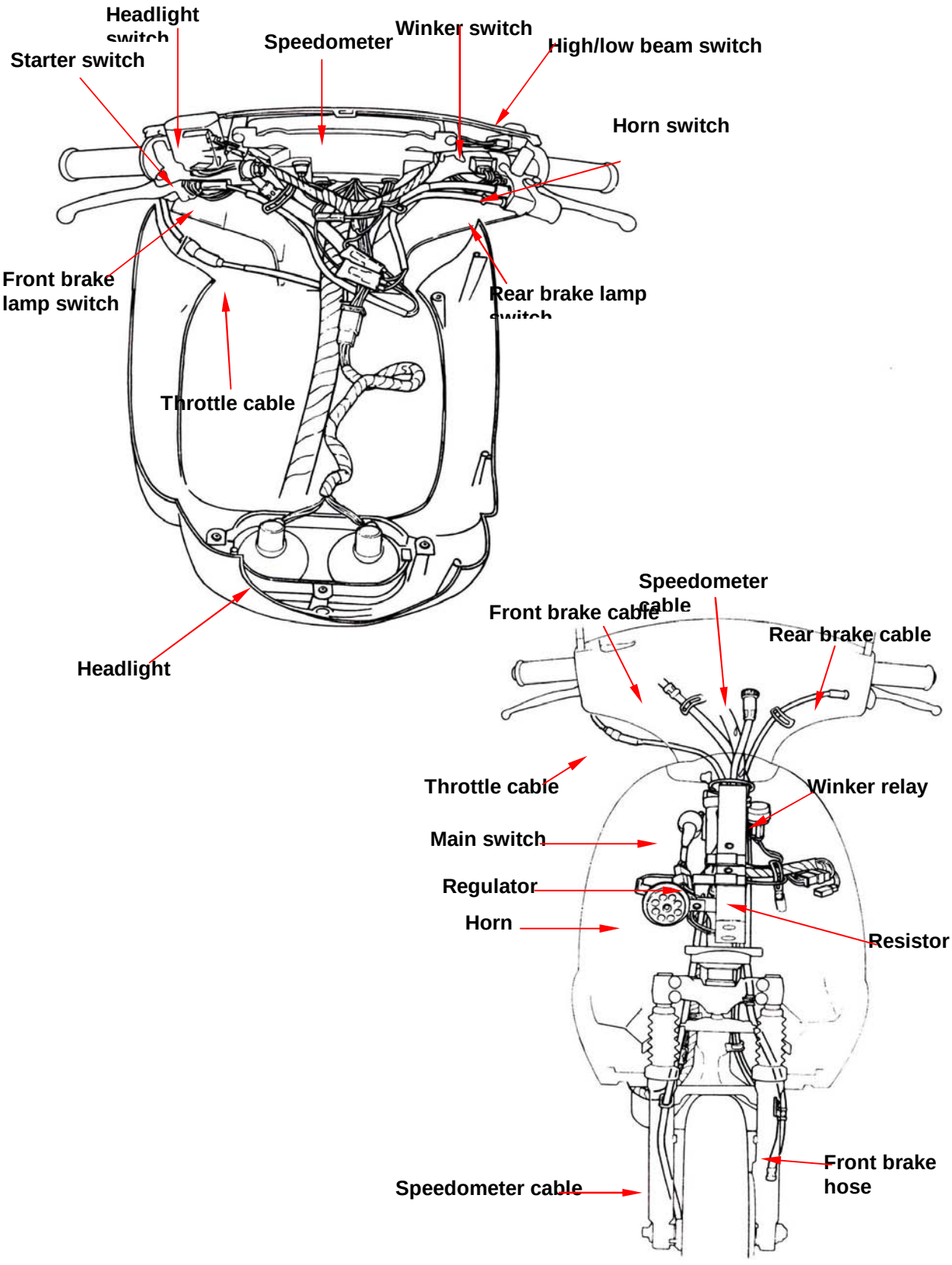
Cables and Harness Routing

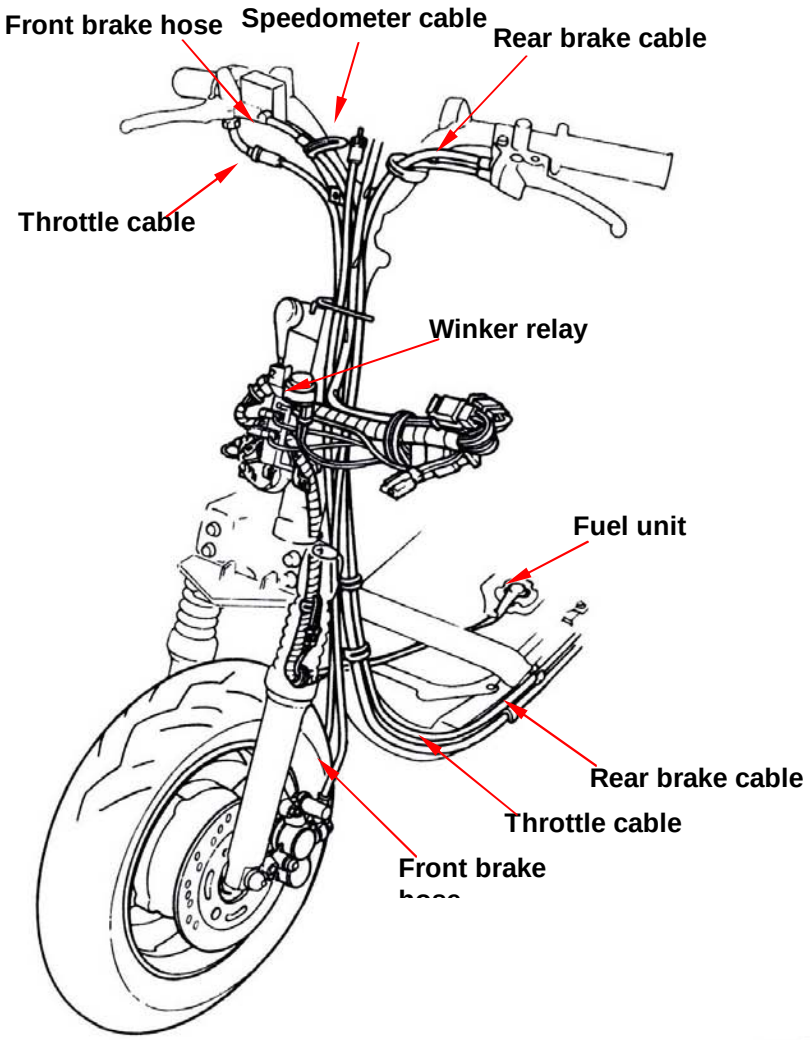
Note the following when routing cables and wire harnesses:

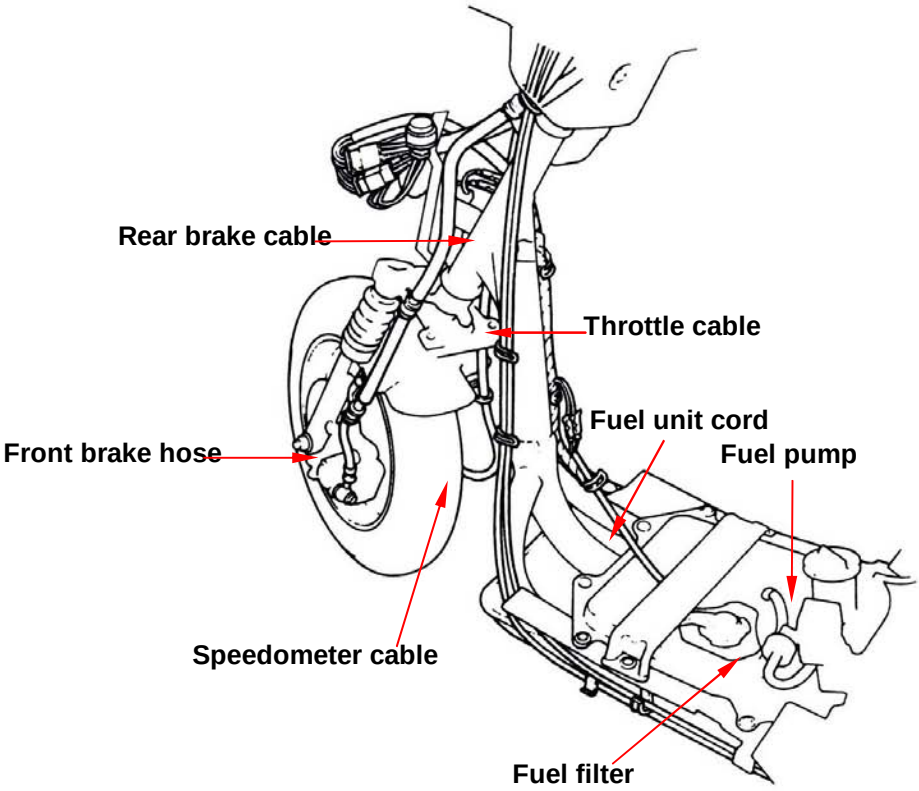
- A loose wire, cable or harness may cause safety hazard. After clamping, check each wire to make sure it is secured.
- Do not squeeze wires against the weld or its clamp.
- Secure wires and wire harnesses to the frame with respective wire bands at the designated locations. Tighten the bands so that only the insulated surfaces contact the wires or wire harnesses.
- Route harnesses so that they neither pull too tight nor have excessive slack.
- Protect wires or wire harnesses with electrical tape or tube if they contact a sharp edge or corner.
- Route wire harnesses to avoid sharp edges or corners.
- Avoid the projected ends of bolts and screws.
- Keep wire harnesses far away from the exhaust pipes and other hot parts.
- Be sure grommets are seated in their groves properly.
- After clamping, check each harness to be certain that it is not interfered with any moving or sliding parts.
- After routing, check that the wire harnesses are not twisted or kink.
- Wire harnesses routed along the handlebar should not be pulled too tight or have excessive slack, be rubbed against or interfere with adjacent or surrounding parts in all steering positions.
- Thoroughly clean the surface where tape is to be applied.
- Wrap electrical tape around the damaged parts or replace them.

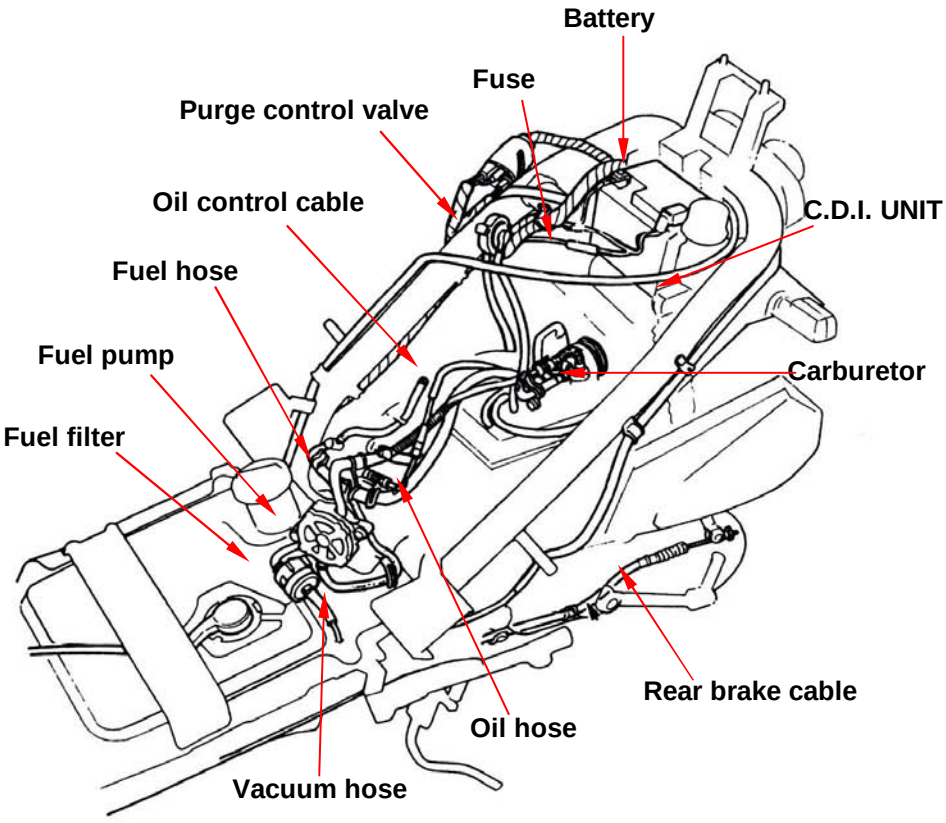


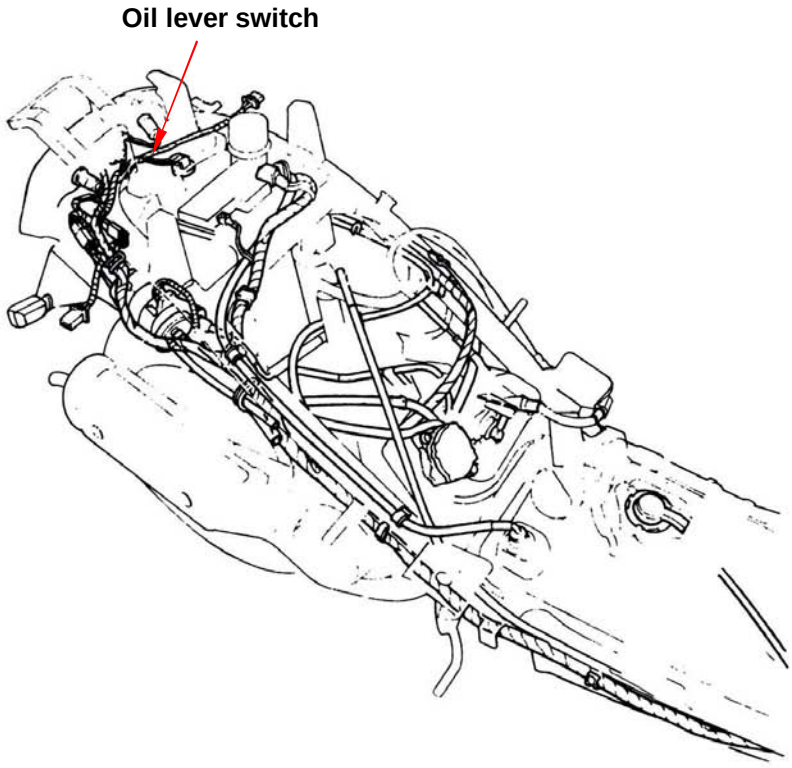
O：Correct X：Wrong


Headlight switch
Starter switch
Speedometer
Winker switch
High/low beam switch
Horn switch
Front brake lamp switch
Rear brake lamp switch
Throttle cable
Headlight
Speedometer cable
Front brake cable
Rear brake cable
Throttle cable
Winker relay
Main switch
Regulator
Horn
Resistor
Front brake hose
Speedometer cable


Front brake hose
Speedometer cable
Rear brake cable
Throttle cable
Winker relay
Fuel unit
Rear brake cable
Throttle cable
Front brake

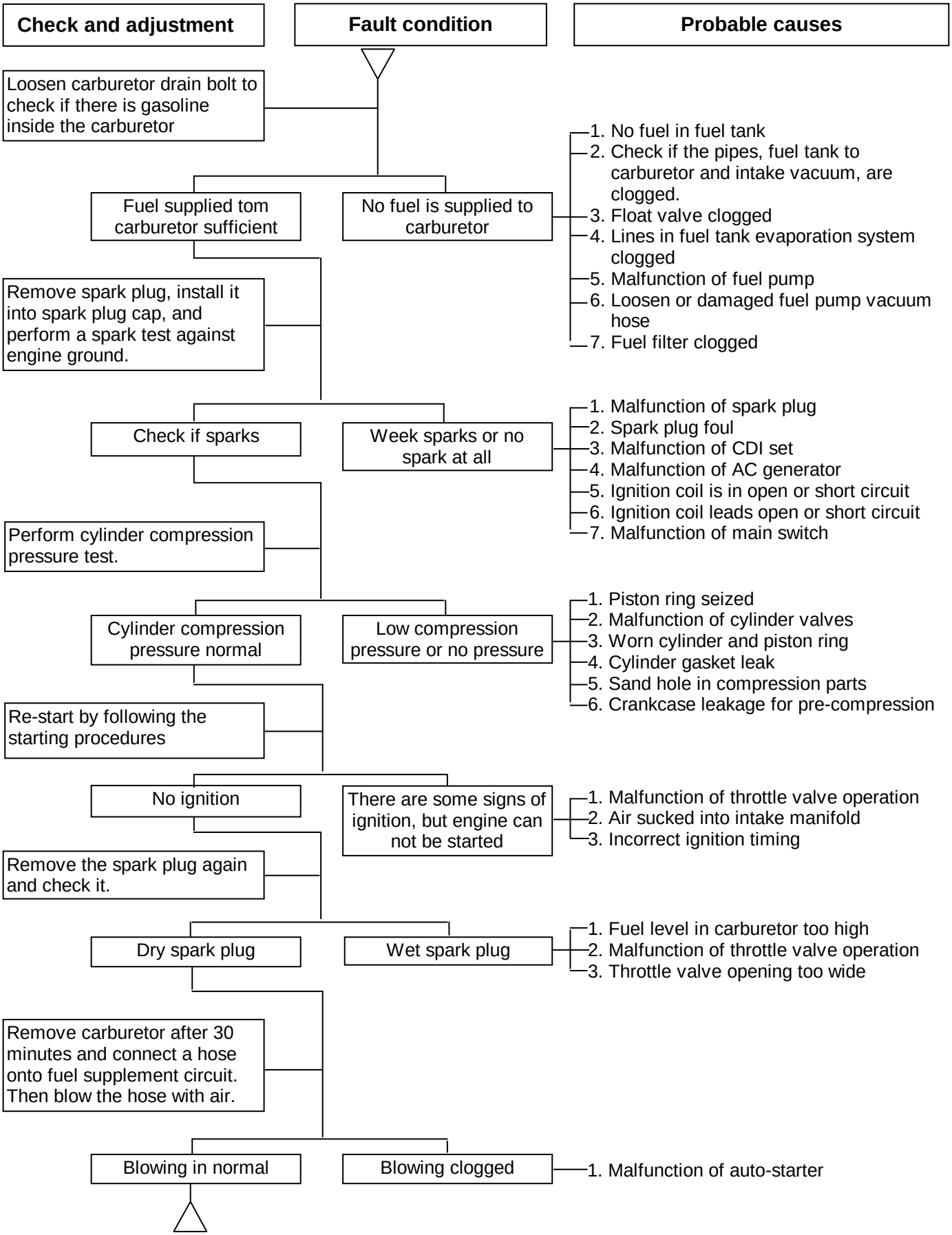

Rear brake cable
Throttle cable
Fuel unit cord
Fuel pump
Front brake hose
Speedometer cable
Fuel filter


Battery
Fuse
Purge control valve
Oil control cable
C.D.I. UNIT
Fuel hose
Fuel pump
Carburetor
Fuel filter
Rear brake cable
Oil hose
Vacuum hose

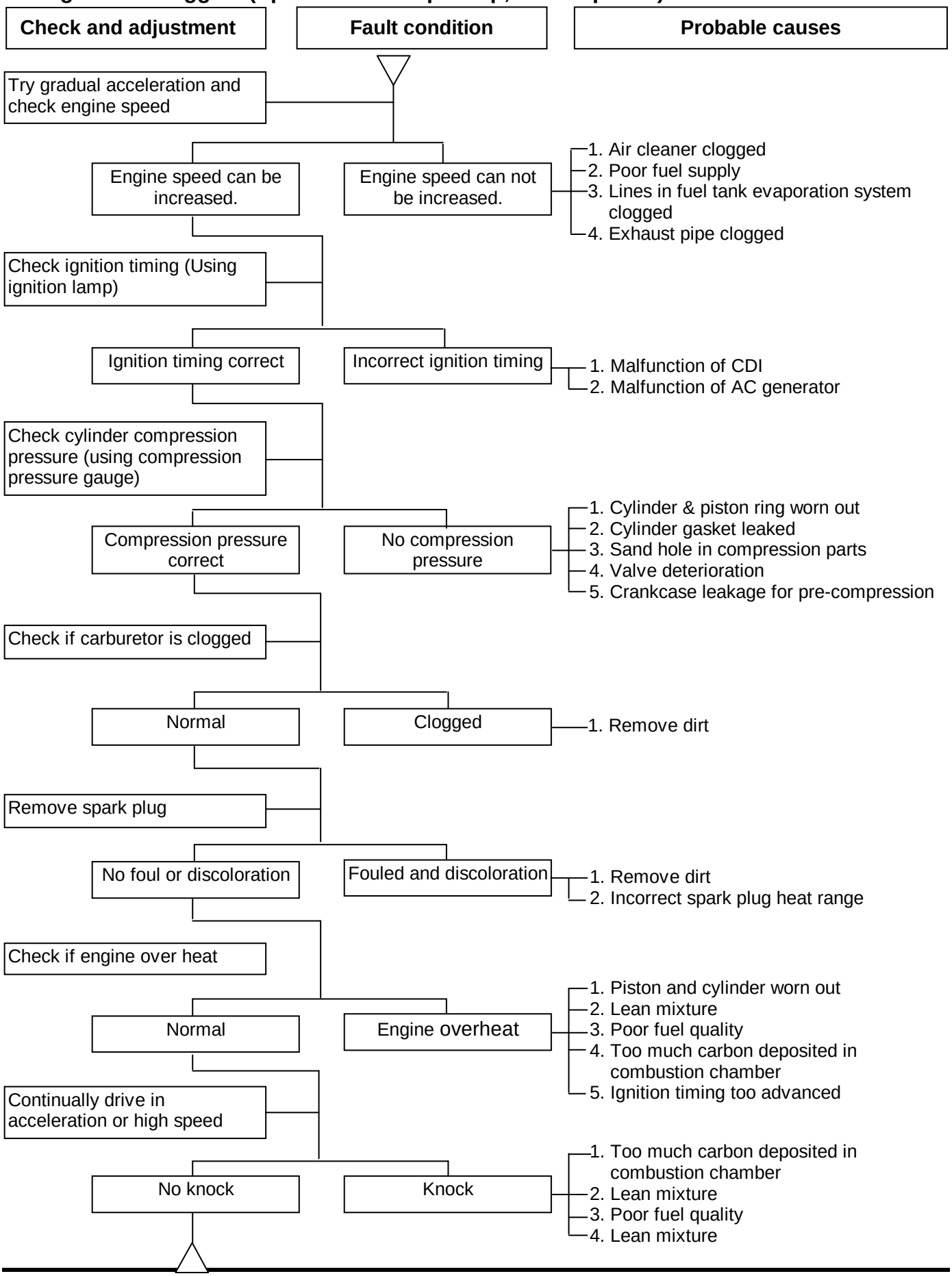

Oil lever switch

Troubleshooting

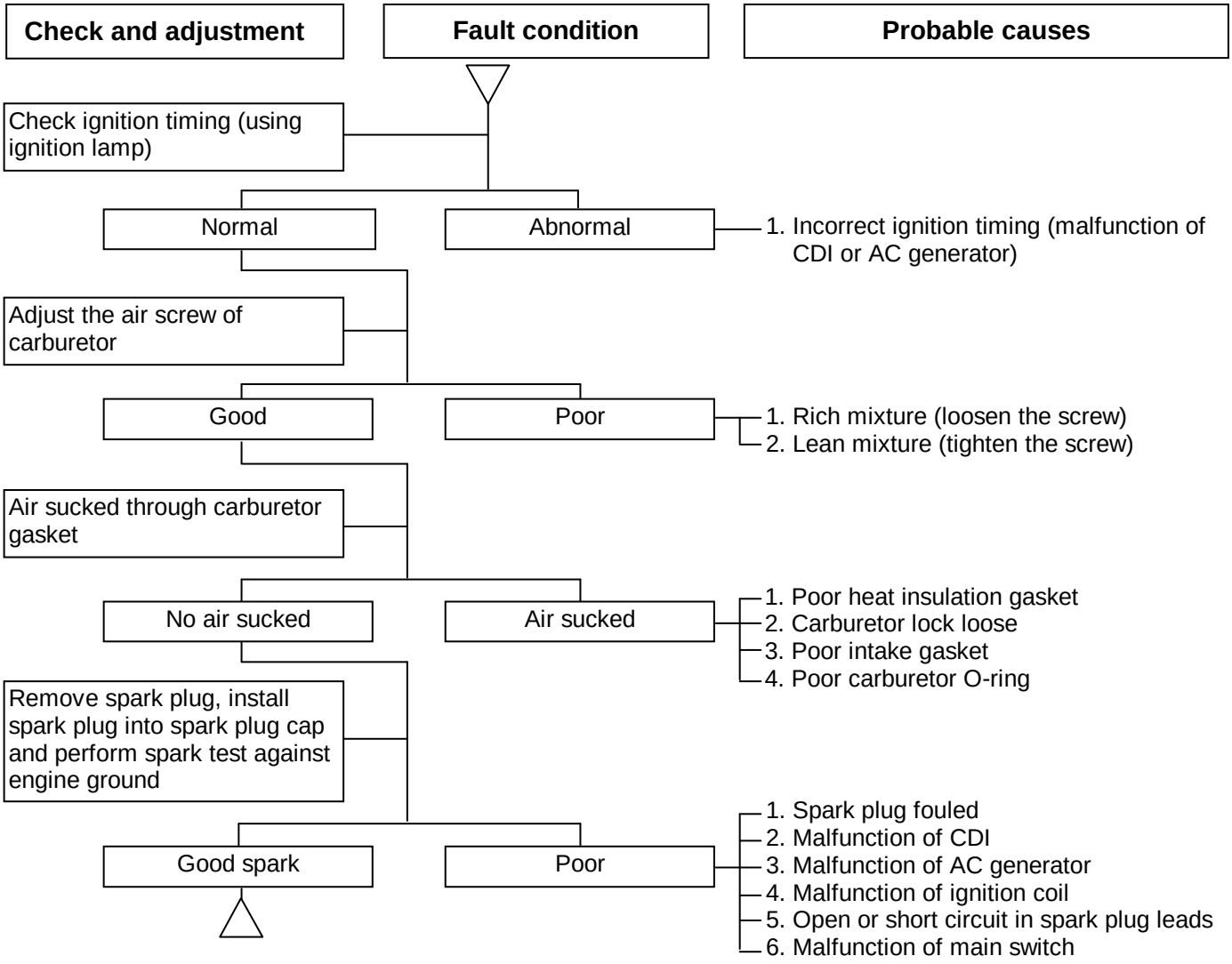
A. Engine hard to start or can not be started


Check and adjustment
Fault condition
Probable causes
Loosen carburetor drain bolt to check if there is gasoline inside the carburetor
Fuel supplied tom carburetor sufficient
No fuel is supplied to carburetor
1. No fuel in fuel tank
2. Check if the pipes, fuel tank to carburetor and intake vacuum, are clogged.
3. Float valve clogged
4. Lines in fuel tank evaporation system clogged
5. Malfunction of fuel pump
6. Loosen or damaged fuel pump vacuum hose
7. Fuel filter clogged
Remove spark plug, install it into spark plug cap, and perform a spark test against engine ground.
Check if sparks
Week sparks or no spark at all
1. Malfunction of spark plug
2. Spark plug foul
3. Malfunction of CDI set
4. Malfunction of AC generator
5. Ignition coil is in open or short circuit
6. Ignition coil leads open or short circuit
7. Malfunction of main switch
Perform cylinder compression pressure test.
Cylinder compression pressure normal
Low compression pressure or no pressure
1. Piston ring seized
2. Malfunction of cylinder valves
3. Worn cylinder and piston ring
4. Cylinder gasket leak
5. Sand hole in compression parts
6. Crankcase leakage for pre-compression
Re-start by following the starting procedures
No ignition
There are some signs of ignition, but engine can not be started
1. Malfunction of throttle valve operation
2. Air sucked into intake manifold
3. Incorrect ignition timing
Remove the spark plug again and check it.
Dry spark plug
Wet spark plug
1. Fuel level in carburetor too high
2. Malfunction of throttle valve operation
3. Throttle valve opening too wide
Remove carburetor after 30 minutes and connect a hose onto fuel supplement circuit. Then blow the hose with air.
Blowing in normal
Blowing clogged
1. Malfunction of auto-starter

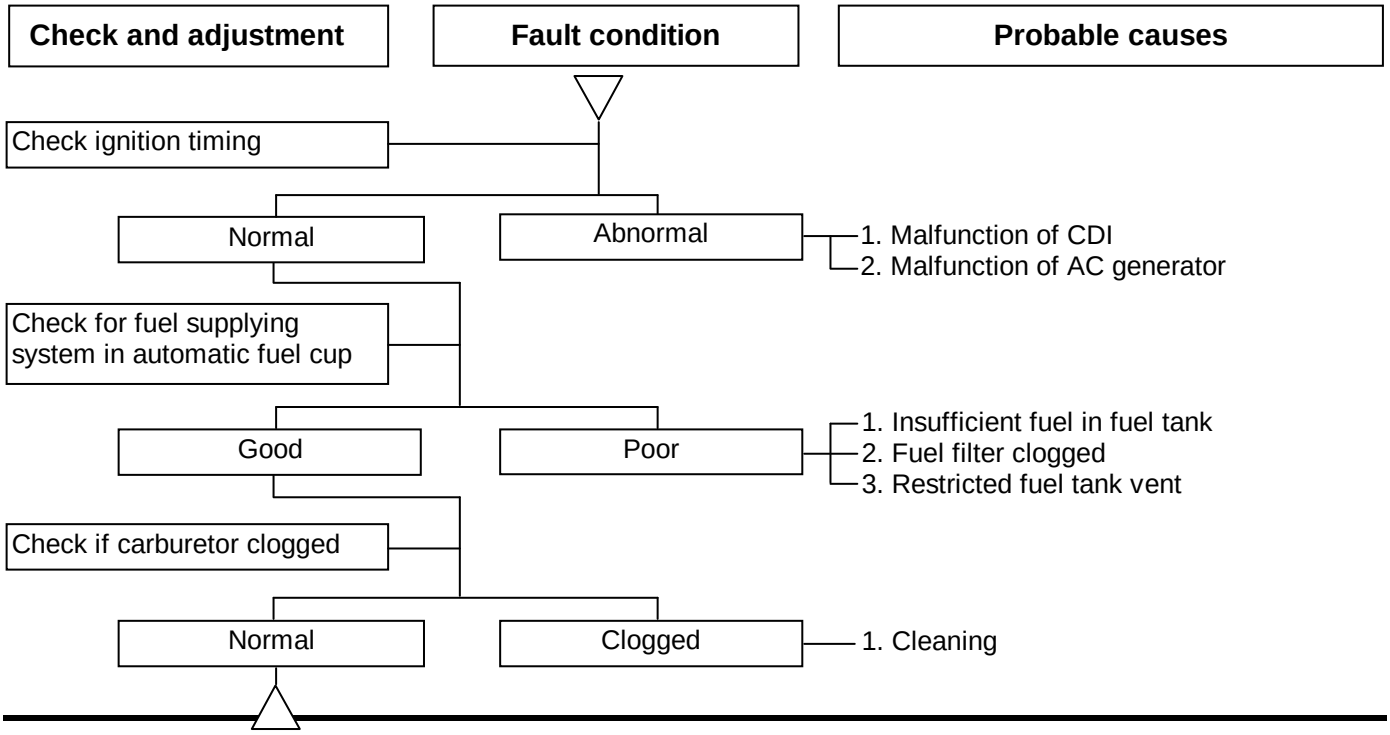
B. Engine run sluggish (Speed does not pick up, lack of power)


Check and adjustment
Fault condition
Probable causes
Try gradual acceleration and check engine speed
Engine speed can be increased.
Engine speed can not be increased.
1. Air cleaner clogged
2. Poor fuel supply
3. Lines in fuel tank evaporation system clogged
4. Exhaust pipe clogged
Check ignition timing (Using ignition lamp)
Ignition timing correct
Incorrect ignition timing
1. Malfunction of CDI
2. Malfunction of AC generator
Check cylinder compression pressure (using compression pressure gauge)
Compression pressure correct
No compression pressure
1. Cylinder & piston ring worn out
2. Cylinder gasket leaked
3. Sand hole in compression parts
4. Valve deterioration
5. Crankcase leakage for pre-compression
Check if carburetor is clogged
Normal
Clogged
1. Remove dirt
Remove spark plug
No foul or discoloration
Fouled and discoloration
1. Remove dirt
2. Incorrect spark plug heat range
Check if engine over heat
Normal
Engine overheat
1. Piston and cylinder worn out
2. Lean mixture
3. Poor fuel quality
4. Too much carbon deposited in combustion chamber
5. Ignition timing too advanced
Continually drive in acceleration or high speed
No knock
Knock
1. Too much carbon deposited in combustion chamber
2. Lean mixture
3. Poor fuel quality
4. Lean mixture

C. Engine runs sluggish (especially in low speed and idling)


Check and adjustment
Fault condition
Probable causes
Check ignition timing (using ignition lamp)
Normal
Abnormal
1. Incorrect ignition timing (malfunction of CDI or AC generator)
Adjust the air screw of carburetor
Good
Poor
1. Rich mixture (loosen the screw)
2. Lean mixture (tighten the screw)
Air sucked through carburetor gasket
No air sucked
Air sucked
1. Poor heat insulation gasket
2. Carburetor lock loose
3. Poor intake gasket
4. Poor carburetor O-ring
Remove spark plug, install spark plug into spark plug cap and perform spark test against engine ground
Good spark
Poor
1. Spark plug fouled
2. Malfunction of CDI
3. Malfunction of AC generator
4. Malfunction of ignition coil
5. Open or short circuit in spark plug leads
6. Malfunction of main switch

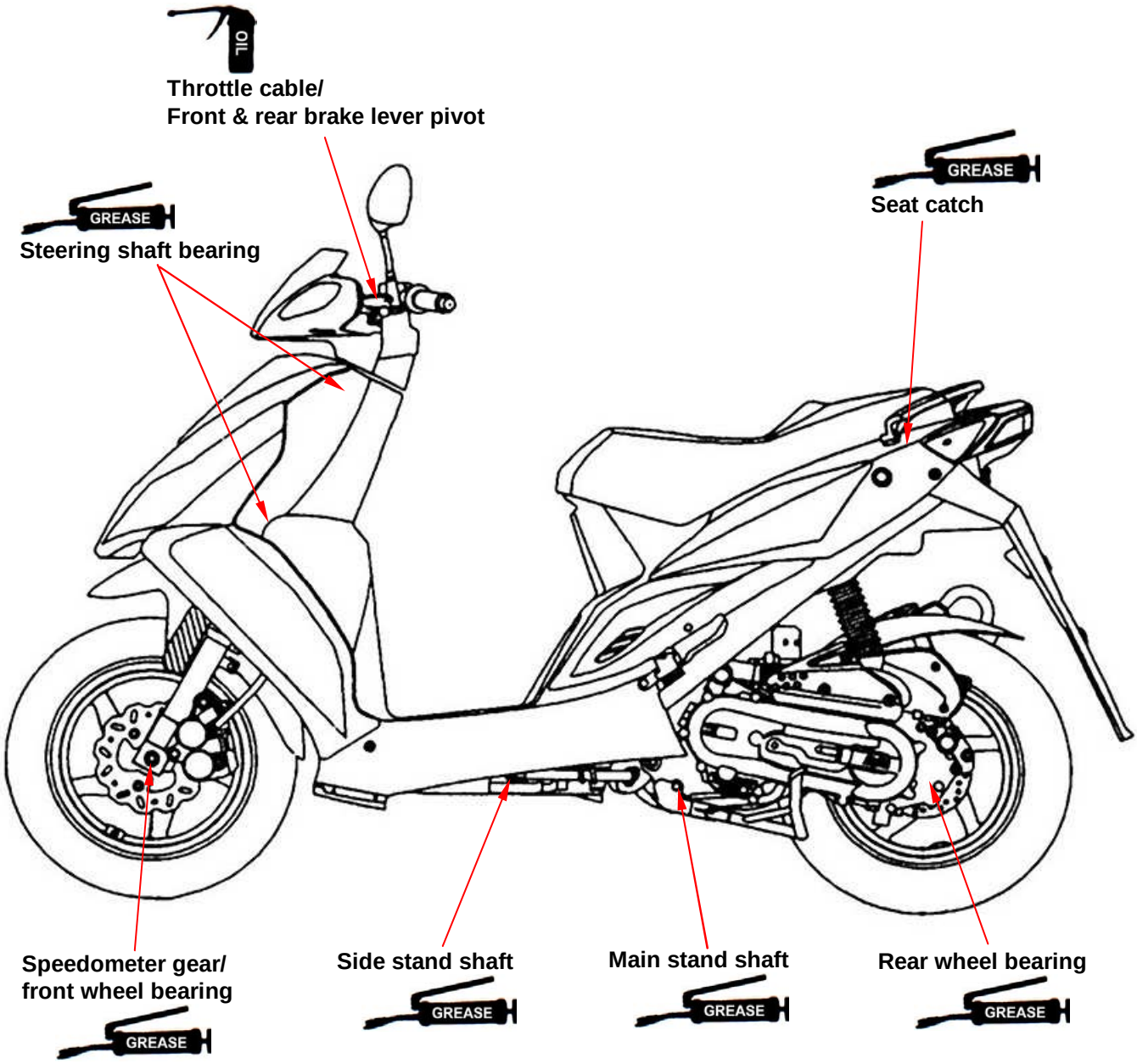
D. Engine runs sluggish (High speed)



E. CLUTCH, DRIVING AND DRIVING PULLEY

FAULT CONDITION	PROBABLE CAUSES
Engine can be started but motorcycle can not be driving	1. Driving belt worn out or deformation 2. Driving disk damaged 3. Driving pulley spring broken 4. Clutch ling broken 5. Driving slide-shaft gear groove broken 6. Transmission gear damage 7. Transmission gear worn out or burned
Engine running and misfire as motorcycle initial forward moving or jumping sudden (rear wheel rotating as engine in running)	1. Clutch ling spring broken 2. Clutch outer cover stuck with clutch balance weights 3. Connection parts in clutch and shaft worn out or burned
Poor initial driving (Poor climbing performance)	1. Driving belt worn out or deformation 2. Balance weight roller worn out 3. Driving sliding gear shaft worn out 4. Driving disk spring deformation 5. Driving sliding gear shaft worn out 6. Greased in driving belt and sliding gear.

Lubrication Points



Note:

2. Service Maintenance Information

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General Information

Specification

Item		Jet Sport X 50 series
Tire dimension		Front: 120 / 70 – 12, Rear: 130 / 70 - 12
Tire pressure at cold	Only rider	Front: 1.75kg/cm^2, Rear: 2.0 kg/cm^2
Rear brake lever free play		10~20 mm
Transmission oil / Recommendation		Type: HYPOID GEAR OIL Oil: SAE #140 Quantity: 0.12 L, Replacement: 0.11L
Spark plug / Recommendation		Type: NGK BR8HAS / Plug gap: 0.6-0.7mm
Driving belt width		Standard 18.0mm Allowable limit: replace it if below 16.5mm
Ignition timing F mark		17°, BTDC/1500 rpm
Acceleration operation		2~6 mm
Idle speed		2000±100 rpm
Cylinder compression pressure		7±1 kgf/cm²

Periodical Maintenance Schedule

	Check item / Maintenance kilometer / Maintenance interval	300KM / New	Every 1000KM / 1 month	Every 3000KM / 3 month	Every 6000KM / 6 month	Every 12000KM / 1 year	Reference
☆	1. Air cleaner	I		C		R	
☆	2. Fuel filter				C		
☆	3. Engine oil filter cleaning	C			C		
☆	4. Oil pump linkage operation check	I		I			
	5. Tire pressure	I	I				
	6. Battery inspection	I	I				
	7. Brake & free play check	I	I				
	8. Steering handle check	I			I		
	9. Cushion operation check	I			I		
	10. Every screw tightening check	I	I				
	11. Gear oil check for leaking	I	I				
☆	12. Spark plug check or change	I		R			
☆	13. Gear oil change	R	**Replacement for every 5000km**				
	14. Frame lubrication				L		
	15. Exhaust pipe	I	I				
☆	16. Carburetor	I	I				
	17. Driving belt check					I	
☆	18. Ignition timing	I	I				
☆	19. Emission check in Idling	I	I				
☆	20. Idle speed check	I	I				
	21. Fuel lines	I		I			
☆	22. Throttle operation	I		I			
☆	23. Engine bolt tightening	I		I			
☆	24. Engine screw torque					I	
☆	25. Carbon cleaning for cylinder head, cylinder, and piston head, and exhaust system.			I			

Have your scooter checked, adjusted periodically by your SYM Authorized Dealer to maintain the scooter at the optimum condition.

Code: I ~ Inspection, cleaning, and adjustment R ~ Replacement

C ~ Cleaning (replaced if necessary) L ~ Lubrication

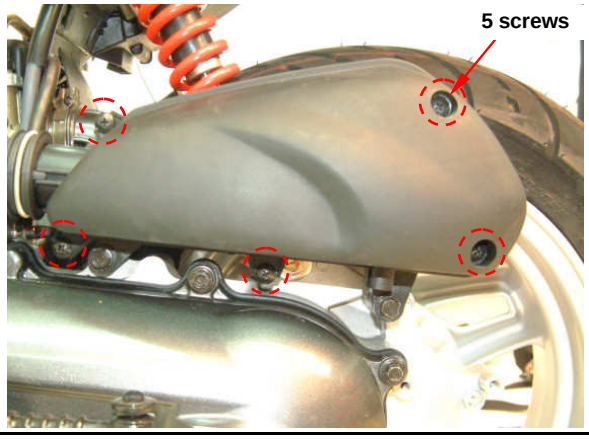
The above maintenance schedule is established by taking the monthly 1000 kilometers as a reference which ever comes first.

Remarks:

1. Clean or replace the air cleaner element more often for pro-long engine life-span when the scooter is operated on dusty roads or in the Heavily- polluted environment.
2. Maintenance should be performed more often if the scooter is frequently operated in high speed and after the scooter has accumulated a higher mileage.

Air Cleaner

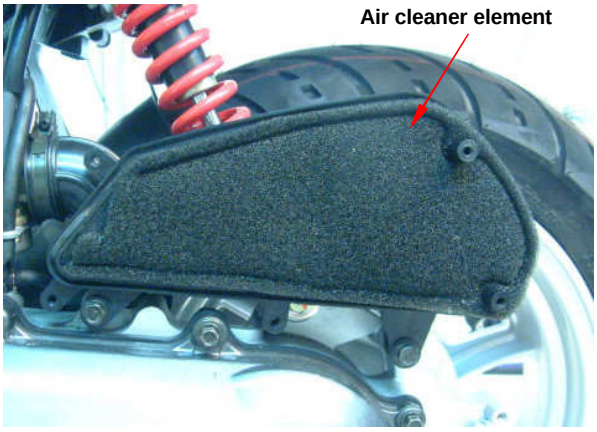
- Remove the mounting screw from the air cleaner cover
- Remove the air cleaner cover



Remove the air cleaner element
Clean the element with non-flammable or high-flash point solvent and then squeeze it for dry.

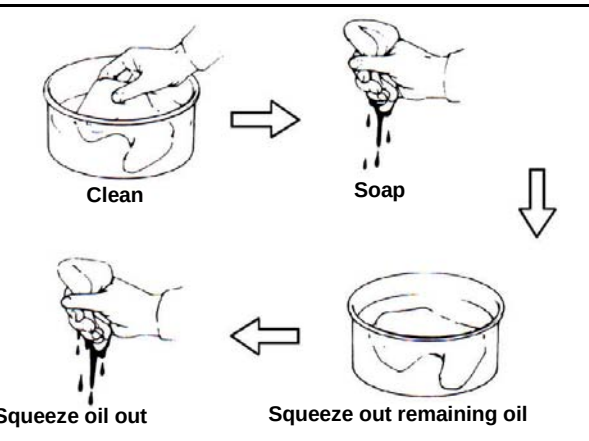
⚠ Caution

Never use gasoline or acid organized solvent to clean the element.



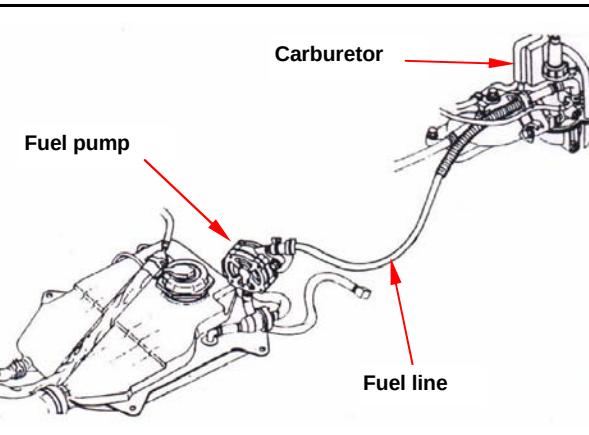
Soap the element into cleaning engine oil and then squeeze it out. Install the element onto the element seat and then install the air cleaner cover.

- Limit to use SAE 20 JASO FC class engine oil; otherwise, SYM is no responsible for the warranty.
- Recommended engine oil: MAX-2 serial oils.



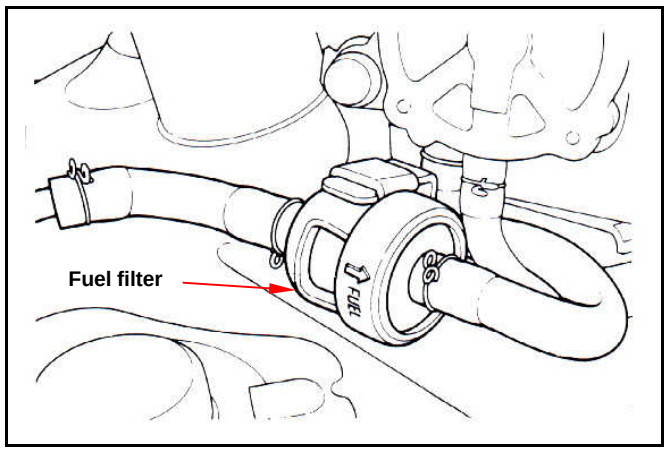
Fuel Lines

Remove the luggage box.
Check fuel lines and replace damaged lines if found.
Install the luggage box.



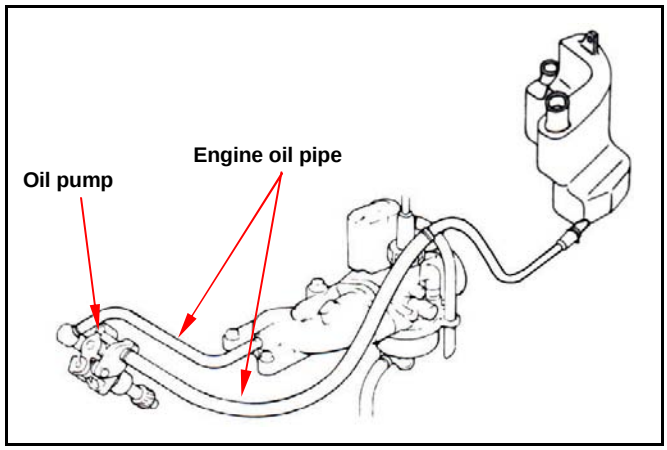
Fuel Filter

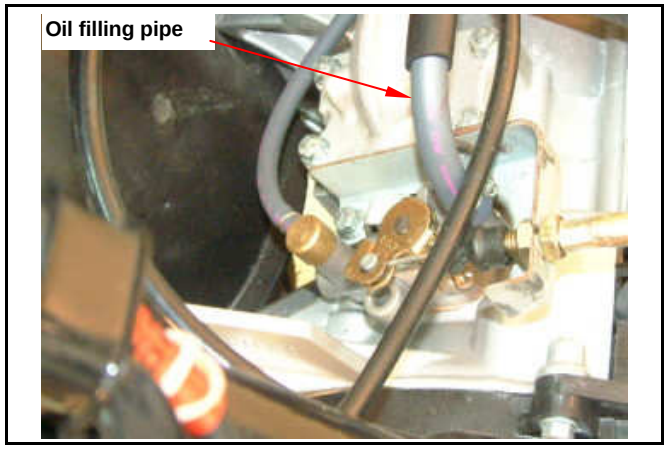
Remove the luggage box.
Remove the fuel line from the fuel filter.
Replace the fuel filter with new one.
Install the fuel filter. The arrow indicates the fuel flowing direction.
Check the fuel line for leaking.

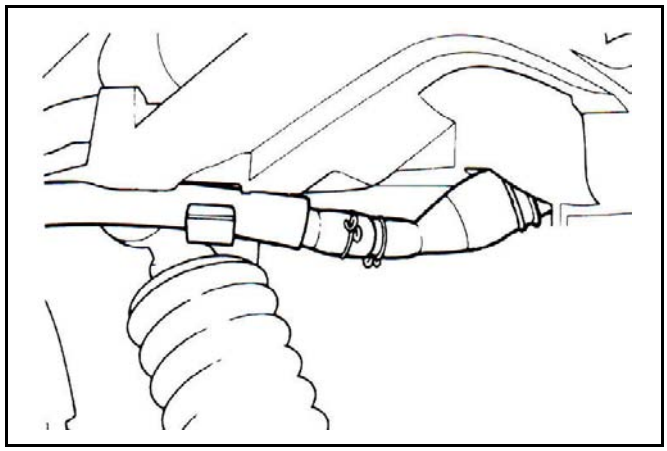


Engine Oil Line

Remove the body cover.
Check the engine oil line and replace damaged parts.
Remove the filling pipe from the oil pump, and drain oil into a cleaning container.
Loosen the clamp under the engine oil tank, and then remove the oil pipe.
Bleed the air inside the oil pump and oil pipe if air found.
Install the body cover.





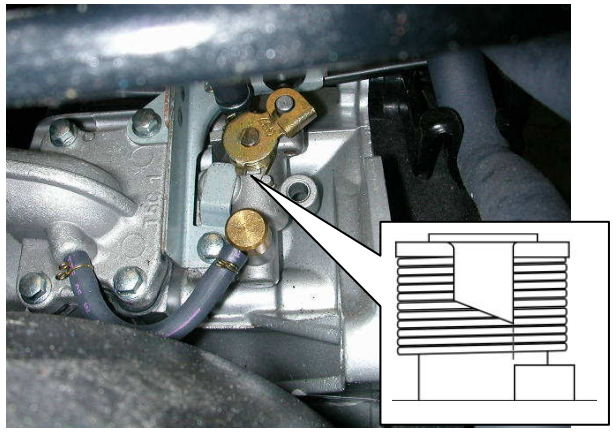


Oil Pump Control Cable

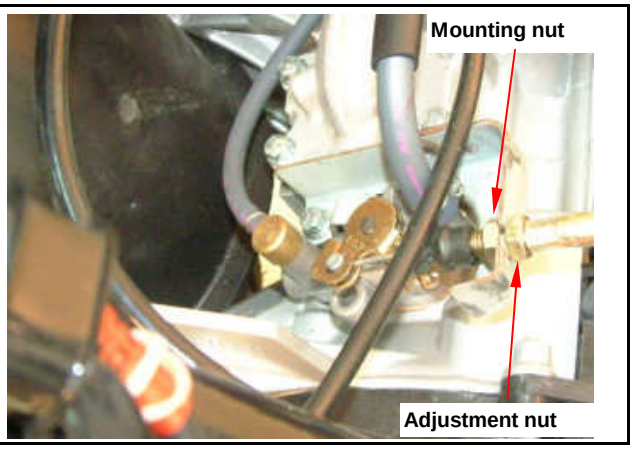
⚠ Caution

To adjust the oil pump control cable after adjusted the throttle grip play.

Remove the luggage box.
Wide open the throttle valve, and check if the calibration point aligns on the oil pump lever with the mark of pump body.

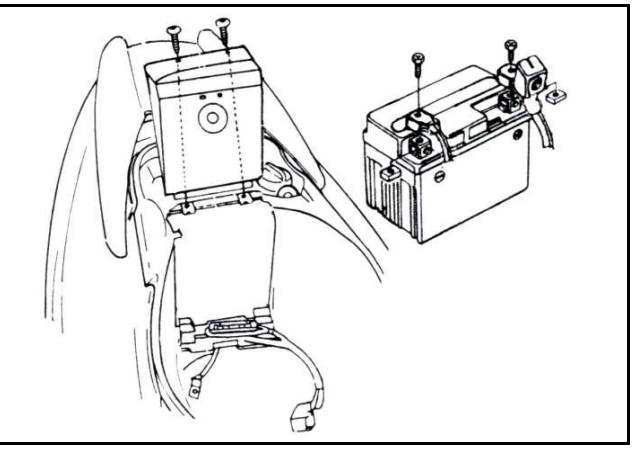


Loosen the adjustment nut of the oil pump control cable.
Turn the adjustment nut and align with the point, then tighten the mounting nut.



Battery

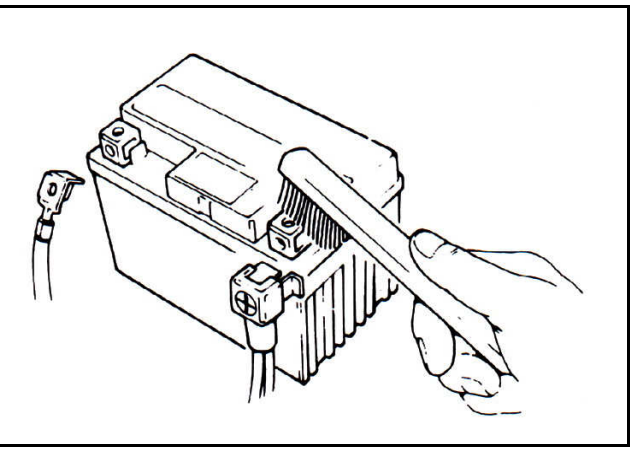
Open the seat.
Loosen two screws of battery cover and then remove the cover.
Check if the battery terminals are loosened.
Remove the battery if its terminals are corroded obviously.



Battery Removal

1. Remove the Negative (-) battery cable at first.
2. Then, remove the Positive (+) battery cable.
3. Remove the battery.

Clean the rust with steel brush.
Install the battery in reverse order of removal, and apply with grease onto two terminals.



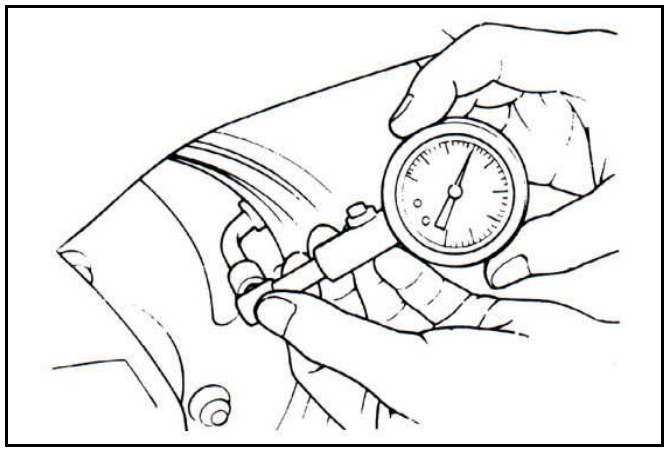
⚠ Caution

The electrolyte is contained sulfuric acid so be careful not to let it touch to eyes, skin, or clothes. If touched by accident, flush them with clean water immediately. However, if the electrolyte sprays to eyes, medical care should be done quickly.

Tire

⚠ Caution

Tire pressure should be checked when cold.

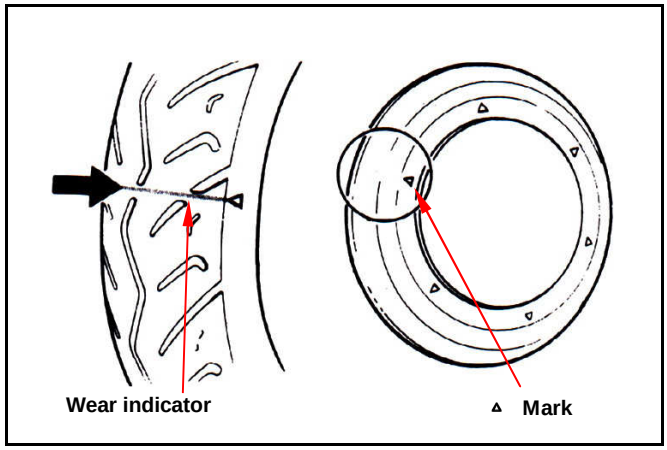


Check tire for cracks, damage, nail, or other object stuck in tread.
Recommended tire and tire pressure

Tire size	Front: 120 / 90 - 10	Rear: 130 / 90 - 10
Tire pressure (cold) kg/cm^2	1.75	2.0

Check if the tire tread and wall rubber for crack or damage, and replace if necessary.
Check if foreign materials such as nail, metal pieces, and stones stuck on tire.
The thread depth can be checked by visual inspection or by a depth gauge.

- If the tread bend too much, replace the tire.
- If tire wear exceeds limitation, replace the tire, and check it for un-even wear.

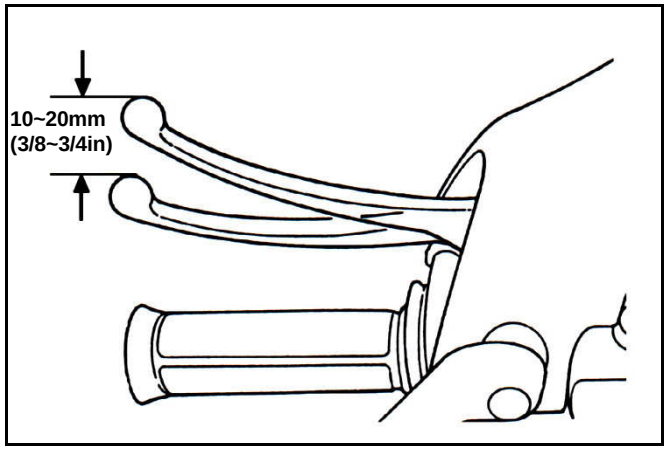


⚠ Caution

Wear indicator "▵ " is distributed on average along the wall rubber for check.

Rear Drum Brake Free Play

Measure the free play of the rear brake lever at the end of the lever.
Free play: 10-20 mm (3/8-3/4 in)

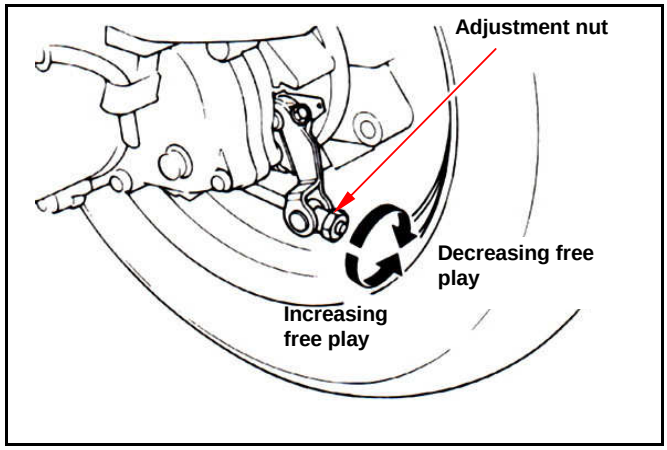


Adjust the free play by turning the front brake adjustment nut if necessary.

Brake Confirmation

⚠ Caution

After brake adjustment, it has to check the brake operation to make sure the front and rear wheel can be braked.



Disc Brake System Hose

Make sure that the brake hose is corrosion or damage, and also check the system for leaking.

Brake Fluid:

Check brake fluid level in the brake fluid reservoir. If the level is lower than the LOWER limit, add brake fluid DOT-3 to UPPER limit. Also check brake system for leaking if low brake level found.

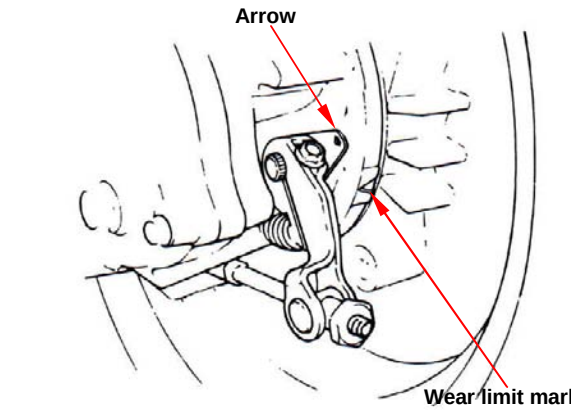
⚠ Caution

- In order to maintain brake fluid in the reservoir in horizontal position, do not remove the cap until handle bar stop.
- Do not operate the brake lever after the cap had been removed. Otherwise, the brake fluid will spread out if operated the lever.
- Do not mix non-compatible brake fluid together.

Brake Lining Wear: (Rear Drum Brake Type)

Replace the brake lining if the wear limit mark "△ " on the brake arm aligning with the indicator of brake drum.

Brake lining replacements refer to chapter 12.



Brake pad Wear: (Disc Brake Type)

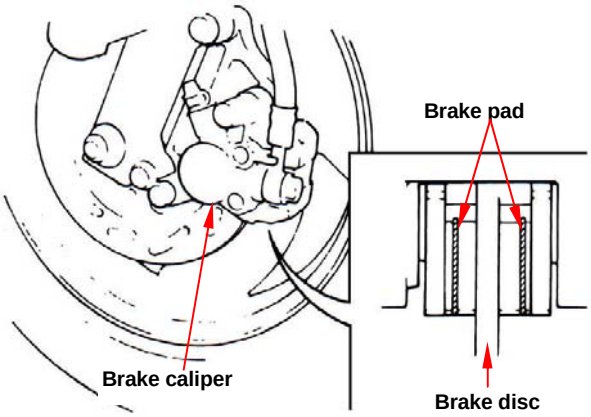
The arrow mark on brake pad is the wear limitation.

Replace the brake pad if the wear limit mark closed to the edge of brake disc.

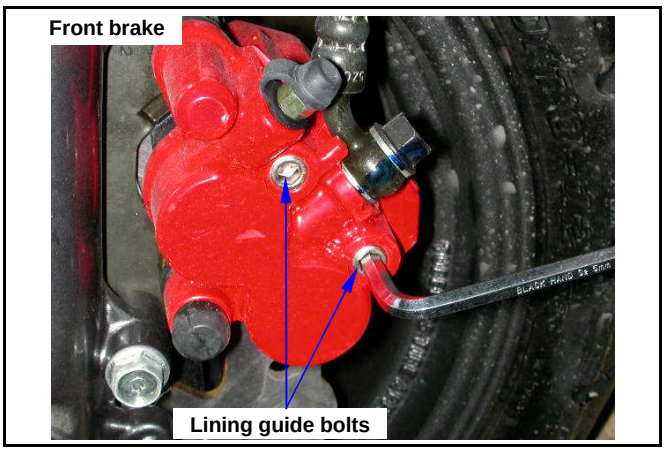
⚠ Caution

In order to maintain brake power balance, the brake lining must be replaced with one set.

Brake pad replacements refer to chapter 12.



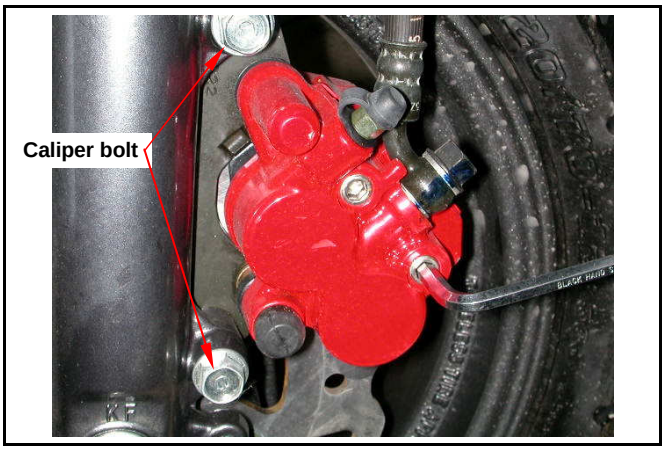
Loosen the guide pin bolts.
Remove the front wheel shaft bolt.
Take out the front wheel.



Remove brake caliper mounting bolt and then remove the brake caliper.

⚠ Caution

Do not operate the brake lever after the clipper removed to avoid clipping the brake lining.

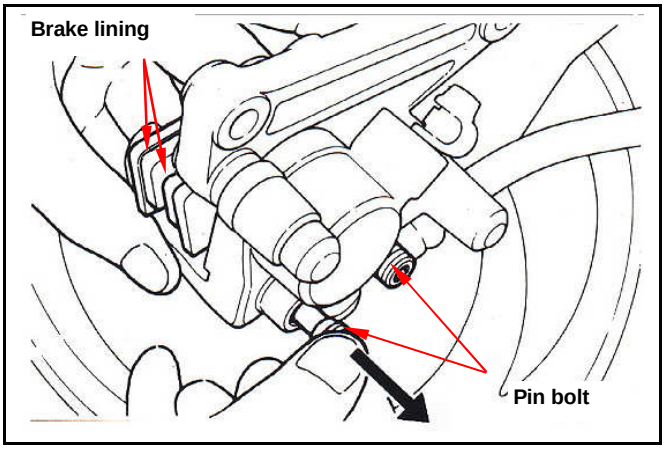


Pry out the brake lining with a flat driver if lining is clipped.

Remove brake lining bolt.
Take out the lining.

Tighten Torque:

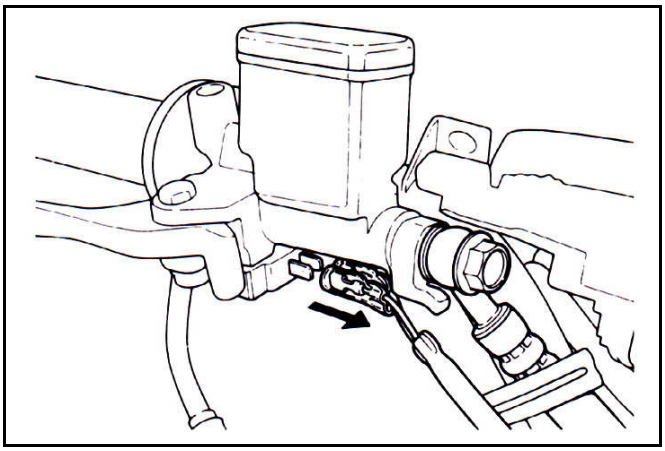
Mounting bolt: 2.9-3.5kgf-m
Pin bolt: 1.5-2.0kgf-m
Pin bolt cap: 0.8-1.2kgf-m



The brake light switch is to light up brake light as brake applied. Replace the switch if the light does not light up in properly.

⚠ Caution

The brake light switch is un-adjustable.

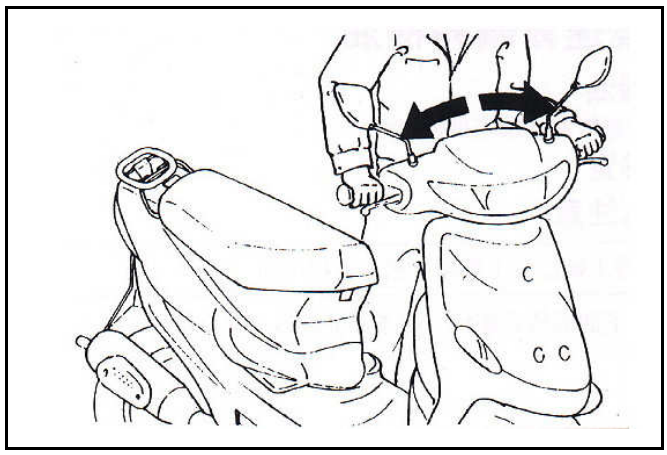


Steering System

⚠ Caution

The control cables cannot interfere with the rotation of steering handle.

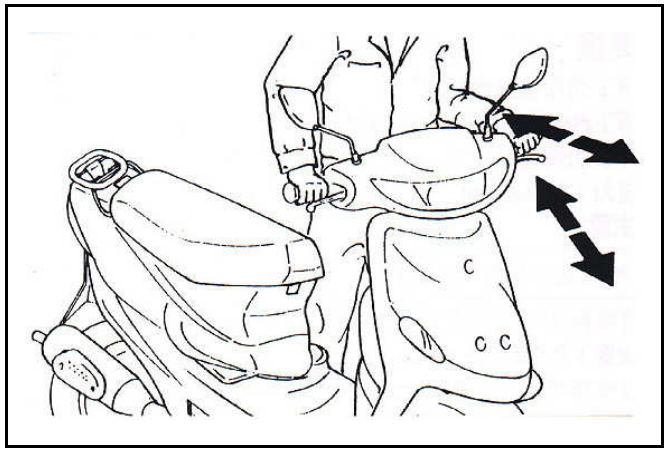
Lift the front wheel out of ground, and check if the steering handle turning is smoothly.
If handle turning is uneven and bending, stuck, or the handle can be operated in vertical direction, then adjust the handle top bearing by adjusting the steering nut.



Suspension

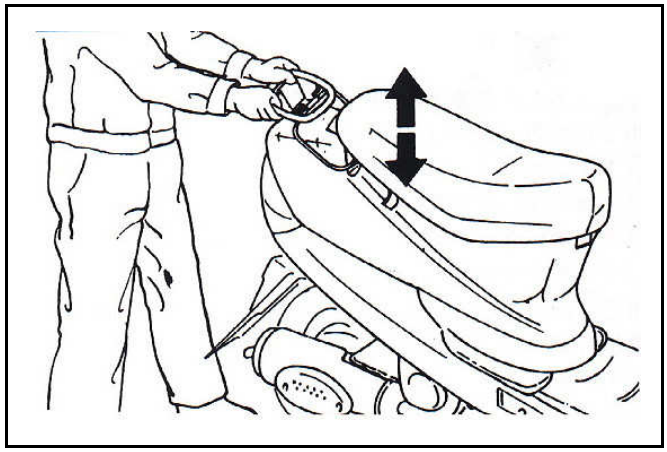
⚠ Warning

Do not ride the scooter with poor suspension. Looseness, wear or damage suspension system will make poor stability and drive-ability.



Front Shock Absorber

Press down the front shock absorber for several times to check it operation.
Check if the shock absorber assembly is damage. Replace it if damage found and can not be repaired.
Tighten all nuts and bolts.



Rear Shock Absorber

Park the scooter with its main stand.
Shake the rear wheel side to side to check engine suspension bushing for wear.
Replace the bushing if looseness found. Check the shock absorber for damage.
Tighten all nuts and bolts.

Nuts, Bolts Tightness

Check if all bolts and nuts on the frame are tightened to specified torque in accord with the interval of Periodical Maintenance Schedule.
Check all split pins, snap rings, hose clamps, and wire holders for security.

Transmission Oil

Leak

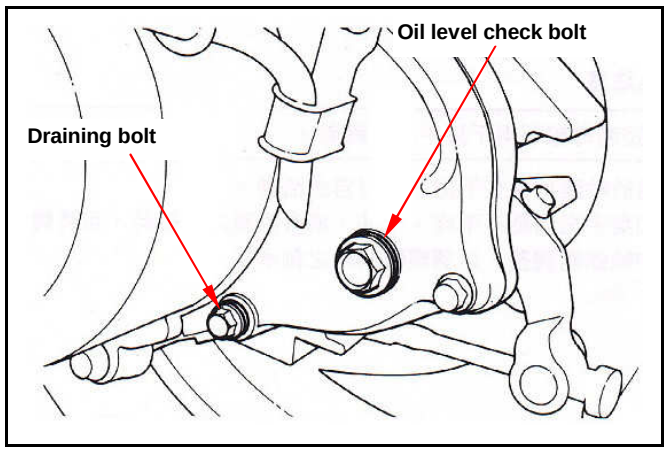
Check if the transmission is leak.

Check

⚠ Caution

Park the scooter on flat ground with its main stand.

Remove the oil level check bolt, and check if the oil level is placed on the hole of check bolt.

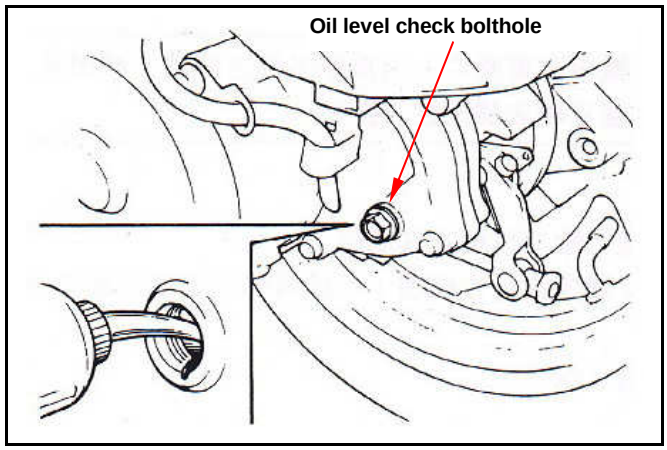


Replacement

Remove the oil level check bolt.
Remove the oil draining bolt, and then drain oil out.
Install the oil draining bolt.
Tighten torque: 1.3kgf-m

⚠ Caution

Check if oil seal and washer is in good condition.

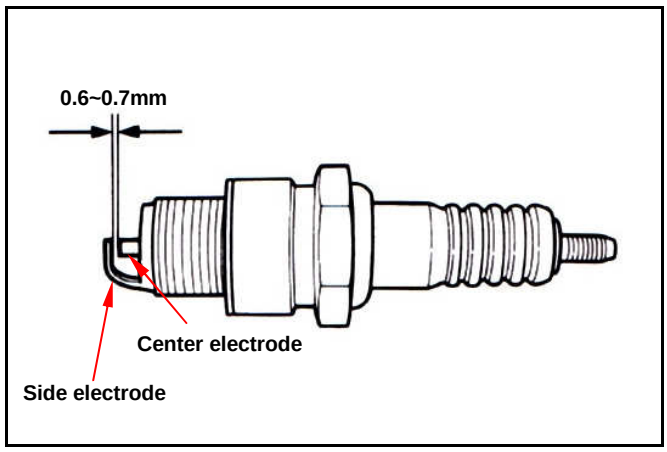


Replacement Quantity: 0.09 L (90 cc)
Recommended oil: King Bramax HYPOID GEAR OIL #140

Spark Plug

Recommended plug: NGK BR8HSA

- Remove the luggage box.
- Remove the spark plug cap.
- Clean any dirt on the spark plug seat.
- Remove the spark plug.
- Visually inspect the spark plug electrodes for wear.
- The center electrode should have square edges and side electrode should have a constant thickness. Replace the spark plug if there is apparent wear or if the insulator is cracked and/or chipped. If the spark plug deposits can be removed by sandpaper, the spark plug can be reused.
- Measure the spark plug gap with feeler gauge.
  Spark plug gap: 0.6-0.7mm (0.024-0.028in)
- Adjust the gap by careful bending the side electrode.
- Install the spark plug by screwing it with hands after installed the spark plug washer so that can prevent the plug from out of thread. Then, tighten the spark plug with a spark plug wrench.
- Install the spark plug cap.

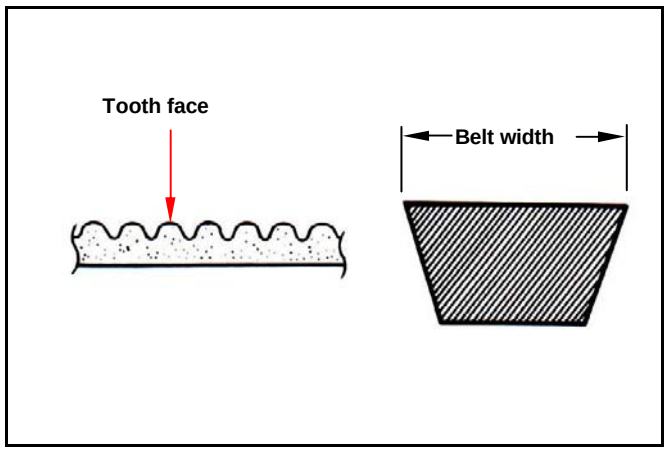


Control Cable Lubrication

Remove the throttle control and the brake cables periodically, and lubricate the moving parts of the cables thoroughly.

Driver Belt

- Remove left crankcase cover.
- Check if the belt is crack or worn out. Replace the belt if necessary.
- Measure the driving belt width
  Allowable limit: 16.5mm

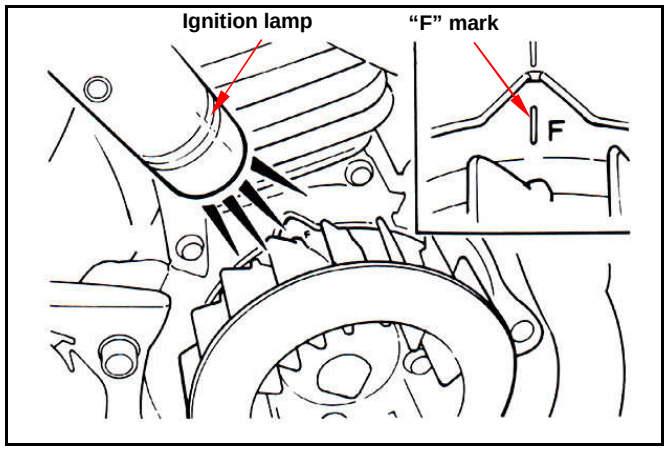


Ignition Timing

⚠ Caution

- C.D.I ignition timing cannot be adjusted. If the ignition timing is incorrect, check the C.D.I. device and the alternator and replace damaged components.
- Check ignition timing with standard instrument.

Remove the right-side cooling fan cover.
Check ignition timing with the timing light.
When engine speed setting to 1800 rpm, and if the mark aligns with “F” mark, then it means that the ignition timing is correct.

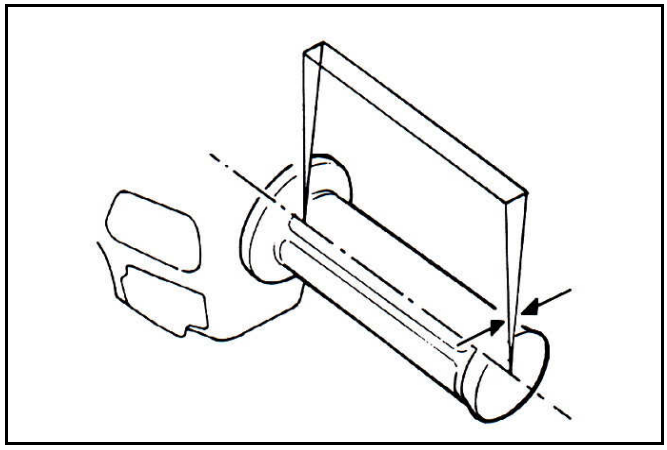


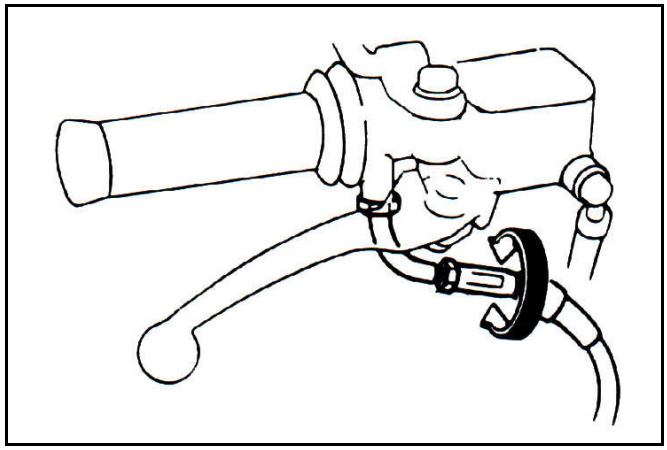
Throttle Valve Operation

Check if each steering positions are operated in smooth, and handle bar if its operation is smooth as the throttle valve wide opening or fully closed.
Check throttle cable and replace it if deteriorated, twisted or damaged.
Lubricate the cable if operation is not smooth
Measure throttle valve handle free play.

Free play：2~6 mm (1/8~1/4 in)

Loosen the mounting nut, and turn the free play adjustment nut of the throttle valve handle for adjustment.
Replace the cable if it can not be adjusted.





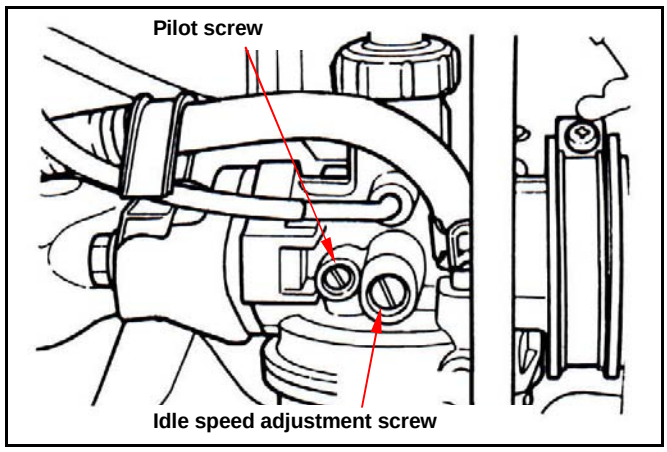
Carburetor Idle Speed Adjustment

⚠ Caution

- Inspection & adjustment for idle speed have to be performed after all parts in engine had been adjusted in specification.
- Idle speed check and adjustment have to be done after engine is being warned up. It around operates engine from stop to running for 10 minutes.

Remove the body cover.
Park the scooter with main stand after warned up engine. According to the required idling and air screw to adjust to specified idle speed.

Idle speed: 2000±100 rpm



Adjust the idling after warn up engine for 10 minutes.

4. Connect tachometer.
5. Adjust the idle speed screw to let engine speed in 2000±100 rpm.
6. Insert the sampling pipe of the CO/HC meter to the test hole on the front end of exhaust pipe. Adjust the idling emission value to standard range. (CO: 1.8-2.6%)
7. Slightly accelerate the throttle valve and release it. Repeat this operation for 1-2 times.
8. Read the engine idle speed and the emission value after engine speed in stable. Repeat the operation on step No. 2 – No. 4. until these value within standard range.

Carbon Removing For Exhaust Pipe & Muffle

Remove the body cover.
Remove the exhaust pipe & muffler.
Clean the carbon deposits on the muffler & cylinder exhaust edge.

Cylinder Compression Pressure Test

Remove the left body cover, and warn up engine.
Stop the engine and remove the spark plug.
Insert the compression gauge and wide open the throttle, and then rotate the engine by means of the starting motor.

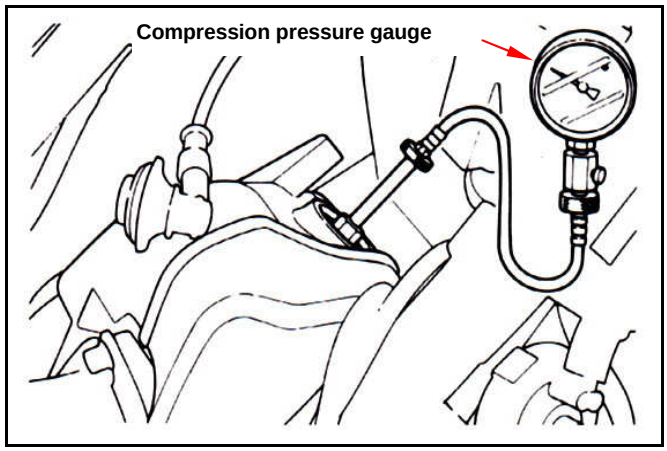
Compression pressure: 7.0±1 kg/cm^2

Probable causes for low compression pressure.

- Damaged cylinder head gasket.
- Worn piston ring
- Worn cylinder

Probable causes for high compression pressure.

- Carbon on the combustion chamber or cylinder head

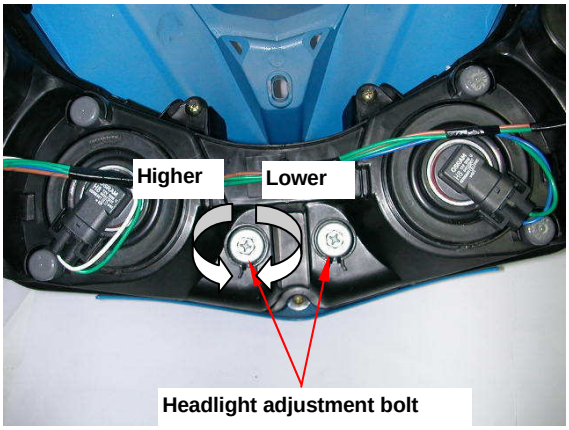


Headlight Adjustment

Turn the headlight- adjustment bolt for adjustment its light beam.

⚠ Caution

Improper headlight beam adjustment will make in coming driver dazzled or insufficient lighting for safety distance.



Special Tool Manual

Name	R/L. Crankcase disassemble tool	Name	R/L. Crank puller	Name	R. Crank shaft puller
No.	SYM-1120100-G5	No.	SYM-1130000-L	No.	SYM-1130000-R
Name	L. Crankshaft install bush	Name	R. Crankshaft install bush	Name	Extension bush
No.	SYM-1130010	No.	SYM-1130020	No.	SYM-1130031(long) SYM-1130032(short)
(ø28mm)		(ø20mm)			
Name	Crankcase bush puller	Name	Crankcase bush puller	Name	ACG. Flywheel puller
No.	SYM-1120310	No.	SYM-1120320	No.	SYM-3110A01
(25*37*6)		(20*32*6)		(27*42*7)	
Name	Oil seal driver	Name	Oil seal driver	Name	Oil seal driver

No.	SYM-9121600	No.	SYM-9120200	No.	SYM-9125500

(6301)

Name	Bearing driver 6301
No.	SYM-9610000

(6203/6004UZ)

Name	Bearing driver Ø17mm
No.	SYM-9620000

(6204)

Name	Bearing driver 6204
No.	SYM-9110400

Name	Inner bearing puller
No.	SYM-6204020

Name	Inner bearing puller
No.	SYM-6204022

Name	Outer bearing puller
No.	SYM-6204001

Name	Clutch nut wrench
No.	SYM-9020200

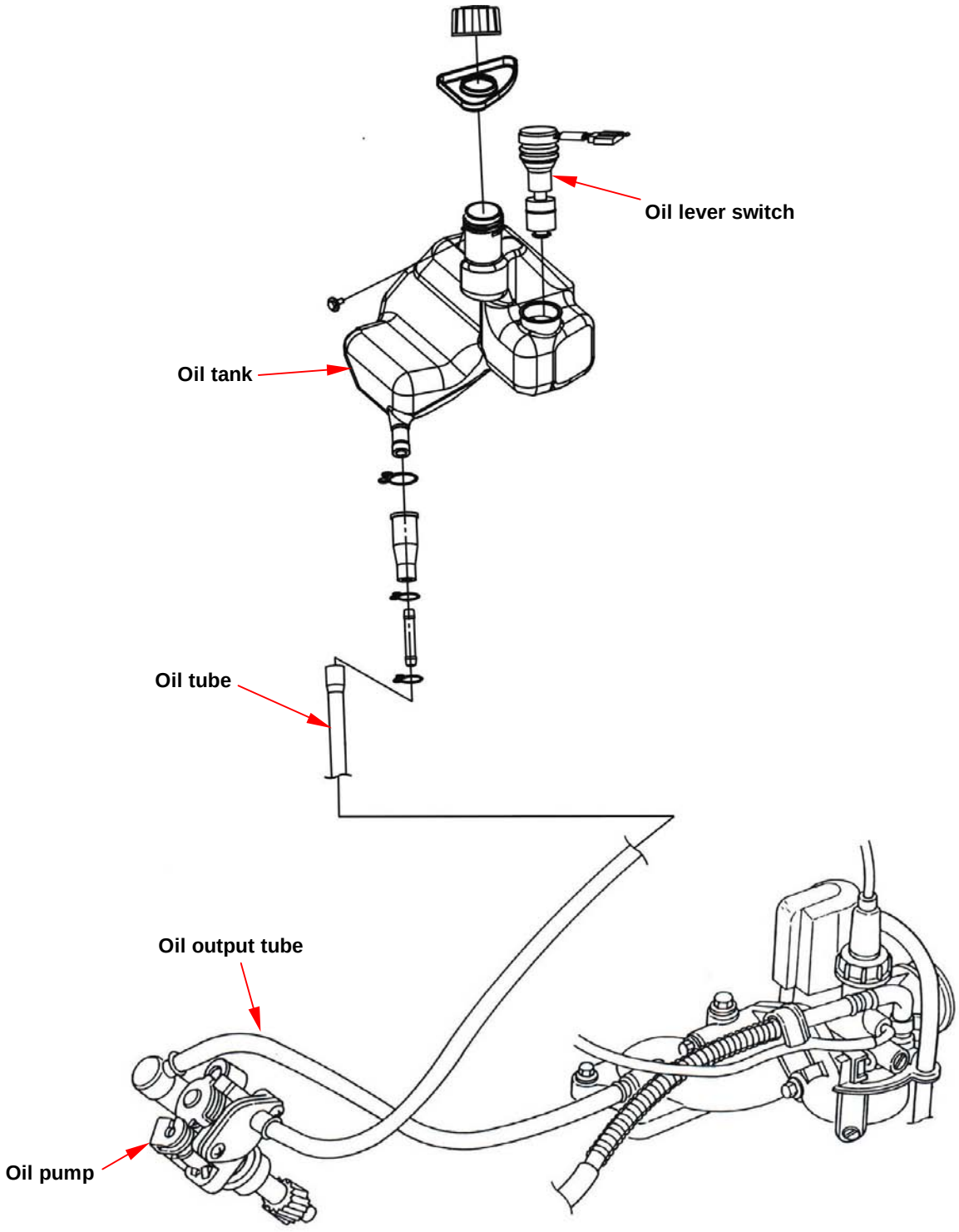
Name	Clutch spring compressor
No.	SYM-2301000

Name	Universal holder
No.	SYM-2210100

Name	Multi-meter
No.	SYM-HE07007-01

Lubrication System Diagram ····· 3-1	Oil Pump Removal ····· 3-3
Precautions In Operation ····· 3-2	Oil Pump Installation ····· 3-3
Lubricant ····· 3-2	Oil Pump/Oil Tube Air Bleeding ····· 3-4
Trouble Shooting ····· 3-2	Oil Tank ····· 3-5

Lubrication System Diagram



3. Lubrication System

Precautions in Operation

Be careful not let dirt enters into engine or oil hoses when removing or installing the oil pump.
If air is found in the oil tube (from oil tank to oil pump) or oil tube is removed, the oil pump should be conducted air-bleeding operation.
It should bleed the oil output tube (from oil pump to carburetor) as hose removed.
The adjustments of oil pump control cable.

Lubricant

Appointed to apply SAE 20 JASO FC class oil. Otherwise, warranty shall not cover the damage.
Recommended oil: MAX-2 oil.
Oil tank capacity: 1.2 lit.

Trouble Shooting

Too much smoke, carbon in spark plug

1. Improperly oil pumps adjustment (too much oil).
2. Poor quality oil.
3. Applying with poor quality oil.

Over heat

1. Improperly oil pumps adjustment (insufficient oil).
2. Poor quality oil.
3. Applying with poor quality oil.

Piston seized

1. No oil in oil tank or clogged hose.
2. Improperly oil pumps adjustment (insufficient oil).
3. Air in oil hose.
4. Malfunction of oil pump.

Oil did not flow out the oil tank

1. Clogged breath hole on the oil tank cover.

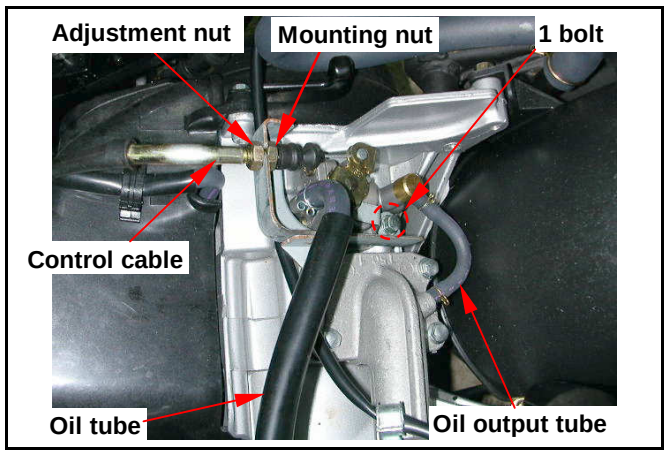
Oil Pump Removal

⚠ Caution

Before removing the oil pump, clean the oil pump and crankcase.

Remove the luggage box and seat.
Loosen the mounting nut of the oil pump control cable, and remove the control cable.
Remove the oil tube, and clip its end side to prevent oil from flowing out.

Remove the oil output tube form intake manifold.
Remove the oil pump mounting bolt, and then take out the oil pump.

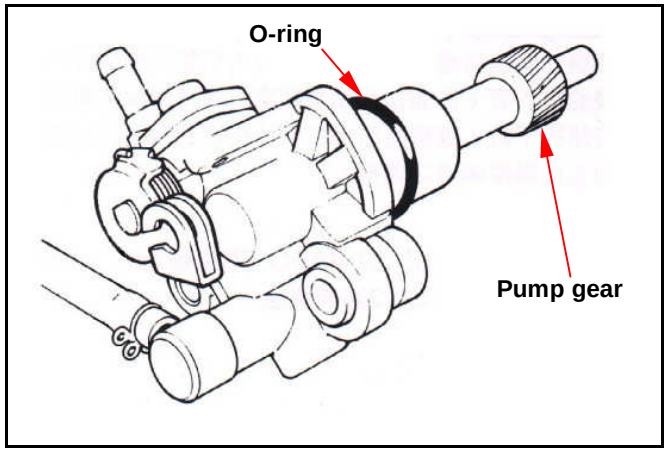


Inspection

Inspect the following items on the removed oil pump.
Check if O-ring is damaged or softening.
Check if crankcase interface is damaged.
Check if pump body is damaged.
Check if pump gear is damaged.
Check for oil leaking.

⚠ Caution

The oil pump cannot be disassembled.

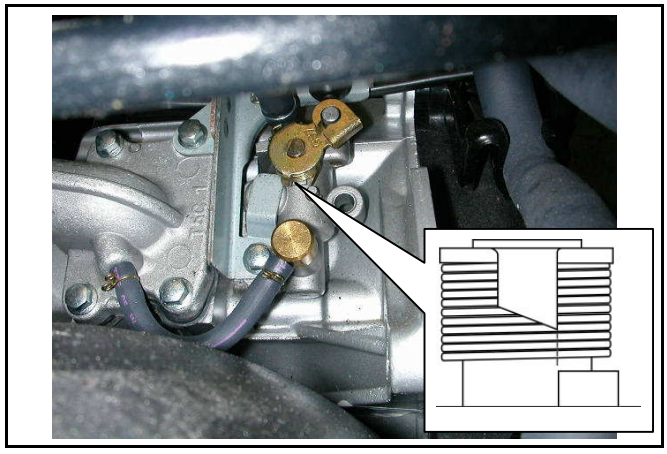


Oil Pump Installation

Install the oil pump onto the crankcase.

⚠ Caution

Apply with some grease onto oil pump O-ring.
The connection between both oil pump and crankcase has to be installed in position security.



Tighten the oil pump mounting bolt security.
Install the oil tube.
Install in the reverse order of removal.

⚠ Caution

Inspection and adjustment following items as installed.
The adjustment operation of control cable.
Air bleeding operation of oil pump.
Air bleeding operation of oil tube.
Check each section for leaking.

Oil Pump/Oil Tube Air Bleeding

⚠ Caution

The oil tube system has to be conducted air bleeding operation because air will clog or restraint oil flowing so that causes serious engine damage.

⚠ Caution

After disconnect the oil tube, air enters oil tube due to oil leak out without added oil. There is why the oil tube and oil pump have to conduct air bleeding operation.

Oil Tube/Oil Pump

It has to add some oil into the oil tank.
Place a piece of dry cloth around the oil pump.
Disconnect the oil tube.
Fill out oil to oil pump connection section by means of the oil pot so that the oil pump body is full with oil.
Fill out oil to oil tube connection section so that the oil tube is full with oil. Then, install the tube onto oil pump.
Make sure whether air is in the oil tube or not after installation.

⚠ Caution

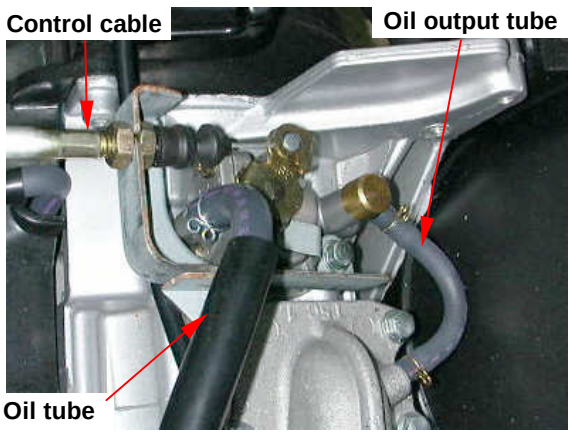
After bleeding the oil tube and oil pump, the oil tube has to be conducted air bleeding operation too.

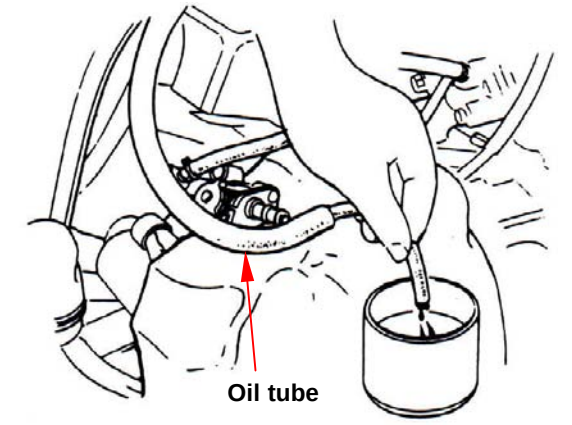
Oil Tube Air Bleeding

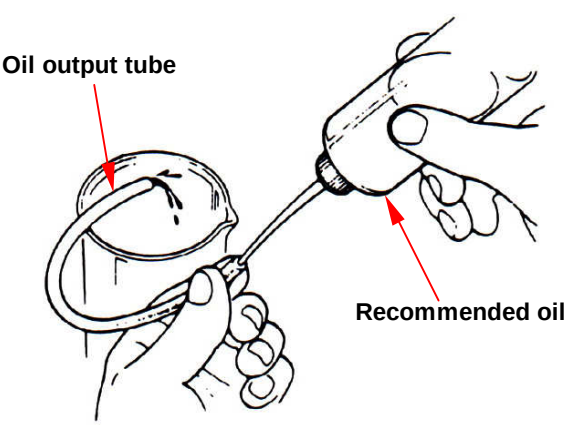
Remove the oil output tube and plug its input connector. Bend the oil tube into “U “shape, and fill out new oil into the output tube.
Connect the oil output tube to the oil pump connection part.
Start engine, and run it in idling as the oil control lever in wide open position. Make sure oil flows out from the oil output tube.

⚠ Caution

Motorcycle’s exhaust gas includes with CO, which causes human to coma or death so perform this operation in well-ventilation place. Run the engine in extreme low speed to avoid to damaging the engine caused from clogged oil tube.



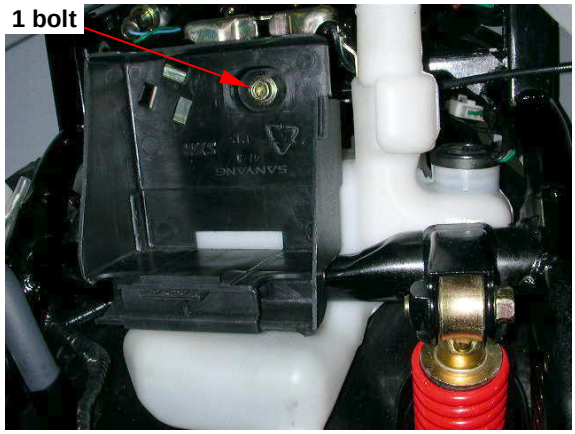




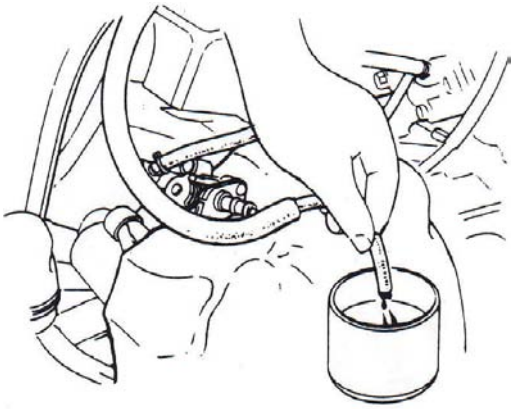
Oil Tank

Removal

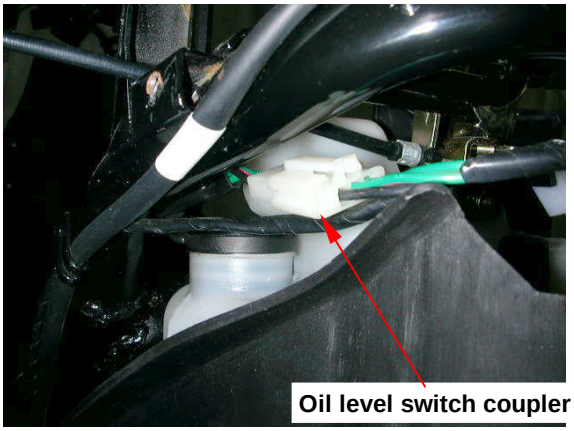
Remove the luggage box and seat.
Remove the right / left side covers, right / left rear side covers, center cover, rear carrier, body covers, rear fender and rear inner fender. (Refer to chapter 11)
Remove the battery and battery case (1 bolt).



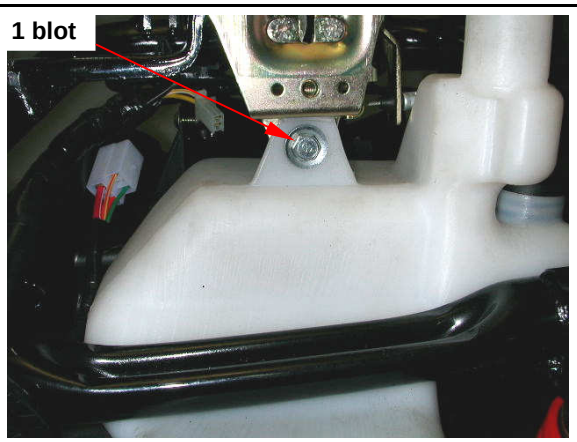
Remove the oil input tube from oil pump, and then drain oil to a clean container.



Remove the oil level switch wire coupler of the oil indicator.



Remove the mounting bolt on the oil tank upper side, and then remove the oil tank.



Installation

Install in the reverse order of removal.
The oil tubes air bleeding after installation.

Notes:

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Carburetor Remove ····· 4-4
Auto By-Starter ····· 4-4
Float/Float Valve/Jet ····· 4-6
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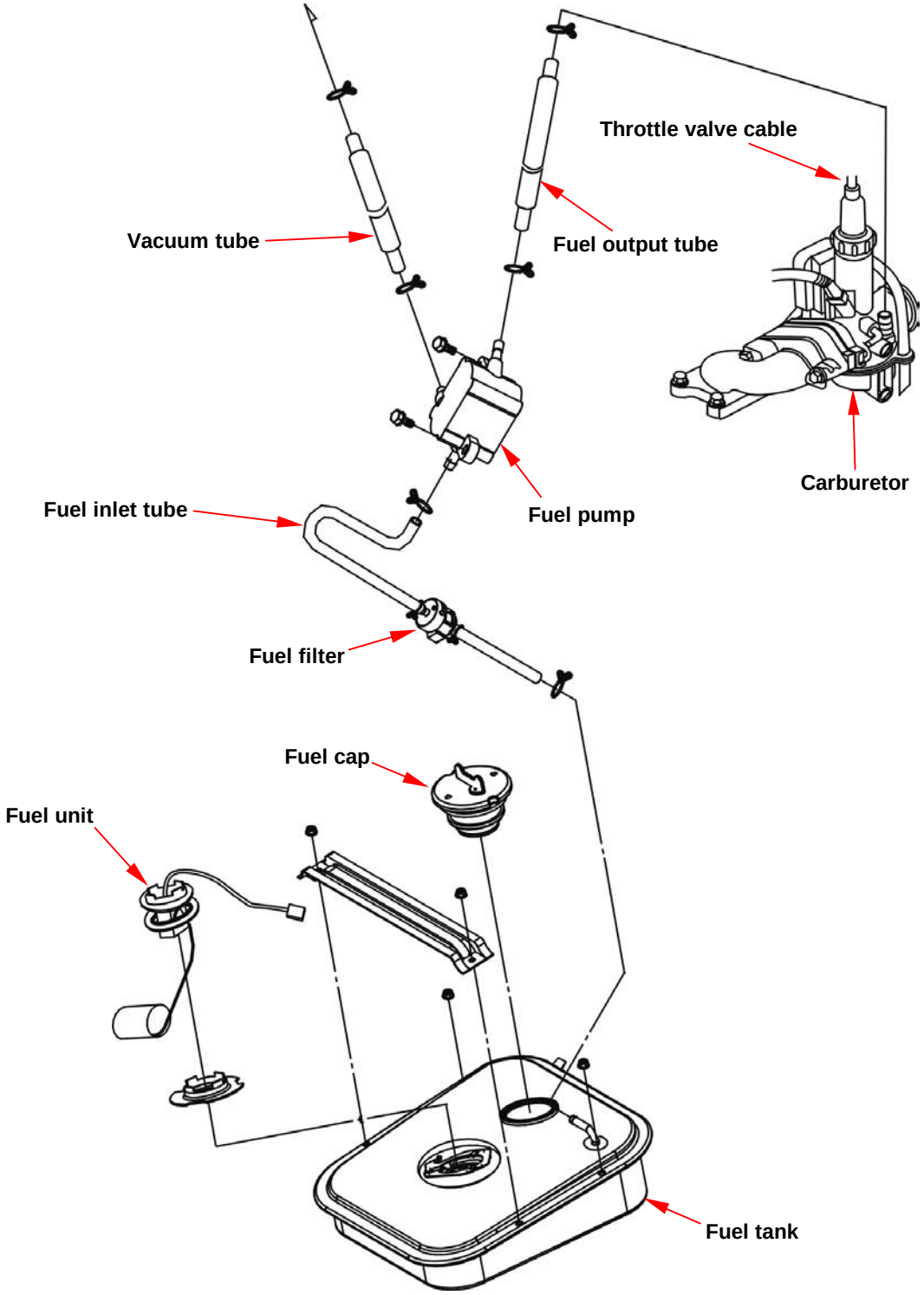


Maintenance Information

Precautions in Operations

⚠ Warning

Gasoline is a highly flammable material and may explosive under circumstance. Thus, always work in a well-ventilated place and strictly prohibit flame when working with gasoline.

- Care must be taken when dealing with gasoline, and always work in a well-ventilated place and strictly prohibit flame.
- When disassembling fuel system parts, pay attention to O-ring position, replace with new one as re-assembly
- It has to conduct air bleeding operation as removed the oil tube.
- Idle speed adjustment.

Specification

Item	Jet Sport X 50
Ventura diameter	15 mm
Fuel level	8.8±1.0mm
Air screw opener	1 3/8
Idle speed	2000±100 rpm
Throttle handle free play	2~6 mm

Troubleshooting

Engine cannot be started

1. No fuel in fuel tank
2. Fuel can not reach to carburetor
3. Too much fuel in cylinder
4. Clogged air cleaner

Stall after started

5. Incorrect idle speed adjustment
6. No spark on the spark plug
7. Low compression pressure
8. Rich mixture
9. Lean mixture
10. Clogged air cleaner
11. Inlet pipe leaking
12. Polluted fuel

Lean Mixture

1. Clogged carburetor jet
2. Clogged hose from carburetor to canister
3. Bend, squeezed or clogged fuel lines
4. Clogged fuel filter
5. Malfunction of float valve
6. Low fuel level in float chamber
7. Clogged vent pipe
8. Malfunction of fuel pump

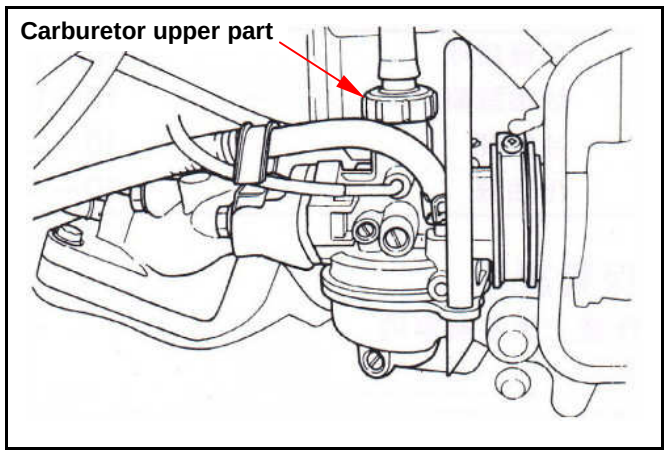
Rich Mixture

13. Malfunction of float valve
14. Low fuel level in float chamber
15. Clogged carburetor air injector

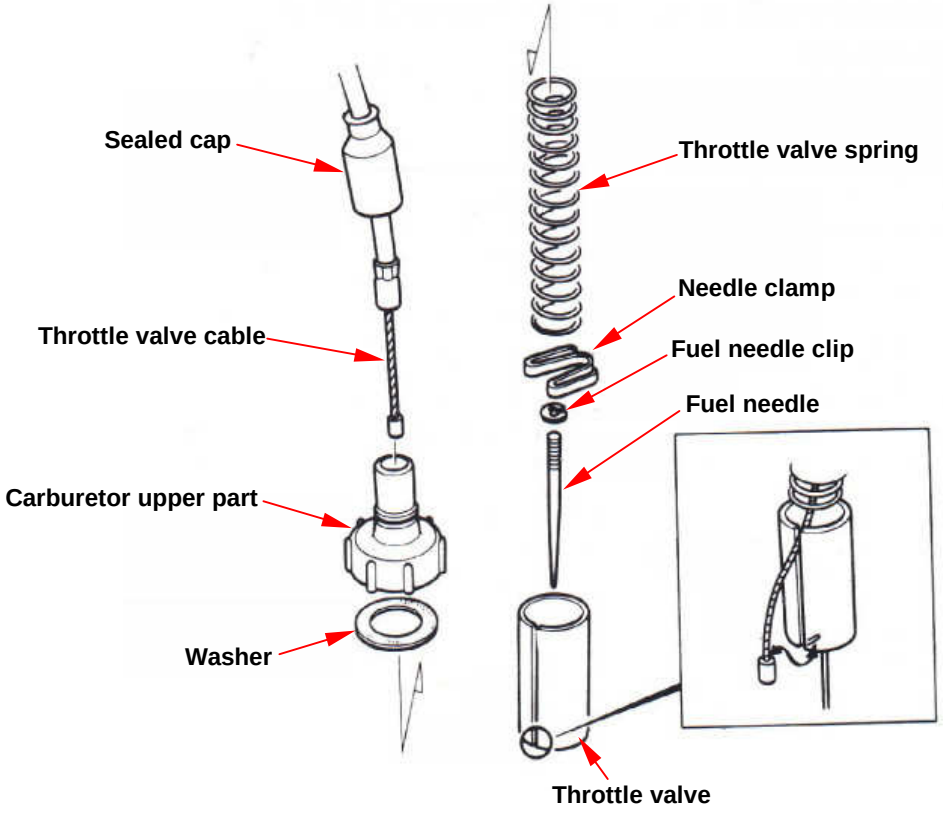
Throttle Valve

Removal

Remove the body cover.
Remove the carburetor upper part, throttle valve spring and sealed cap.
Remove the throttle valve cable from the throttle valve.
Remove needle clamp and fuel needle.



Inspection



Installation

Place the fuel needle onto the throttle valve and clip it with needle clamp.
Install the sealed cap, carburetor upper part, and throttle valve spring.
Connect the throttle valve cable to the throttle valve.
Install the throttle valve into the carburetor body.

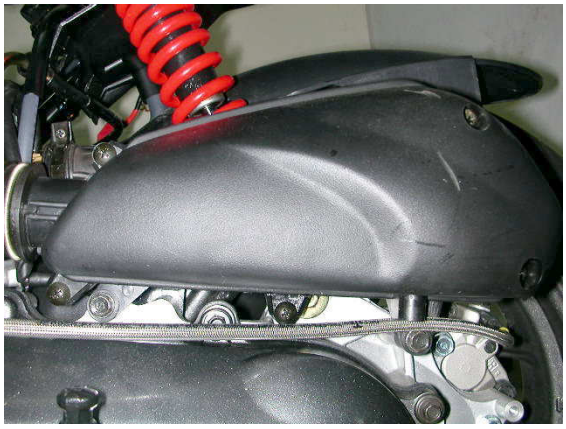
⚠ Caution

Align the groove inside the throttle valve with the throttle stopper screw of the carburetor body.

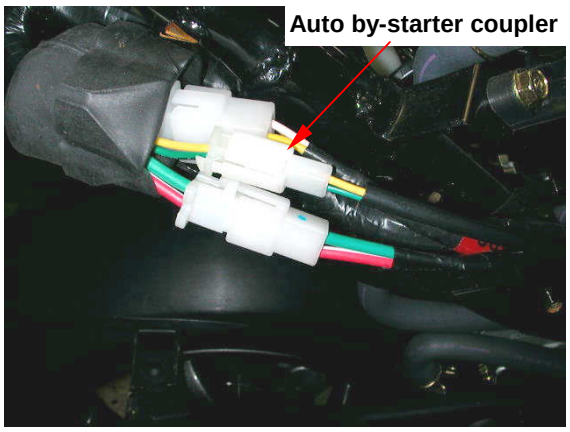
Tighten the carburetor upper part.
Adjust the free play of throttle valve cable.

Carburetor Remove

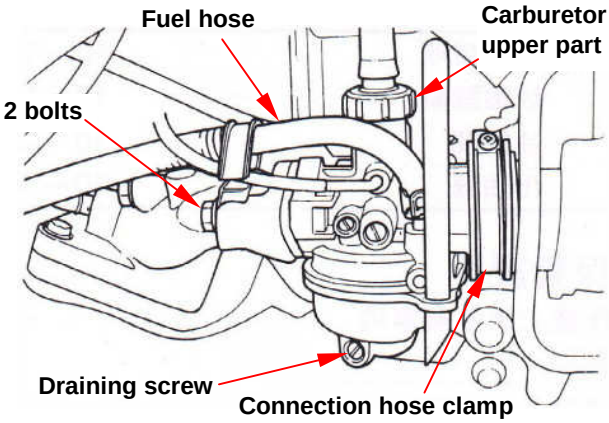
Remove the rear side cover.



Disconnect the auto by-starter coupler.



Loosen draining screw and then drain out fuel inside the carburetor.
Loosen carburetor upper part and remove carburetor upper part.
Remove fuel and oil hoses from carburetor.
Remove carburetor mounting bolt and carburetor.



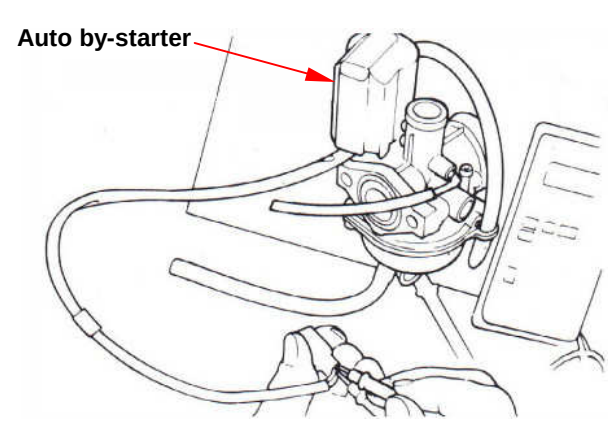
Auto By-Starter

Inspection

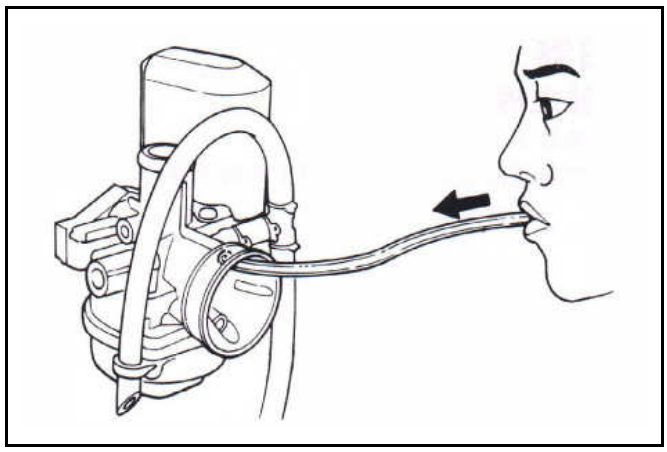
Connect resistor meter to the terminals of auto by-starter, and then measure its resistance.
If the resistance value exceeds specification too much, it means that the PTC in the auto by-starter is malfunction. Then, replace the auto by-starter.
Resistance value: Max. 10Ω (at cold engine)

⚠ Caution

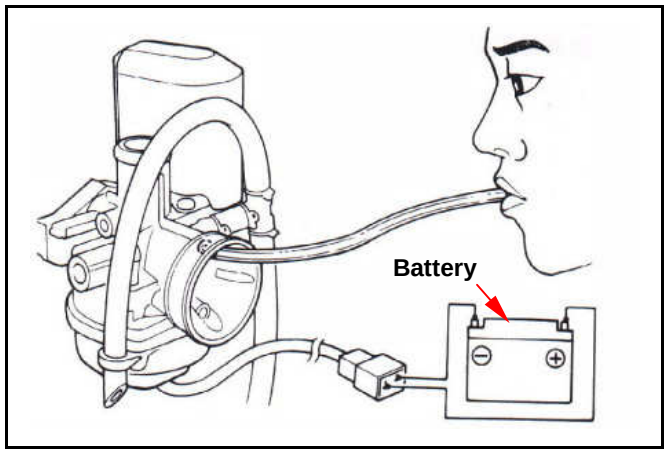
If the resistance value exceeds the standard a little bit, the auto by-starter may still in normal. However, it is necessary to check other relative components for damage.



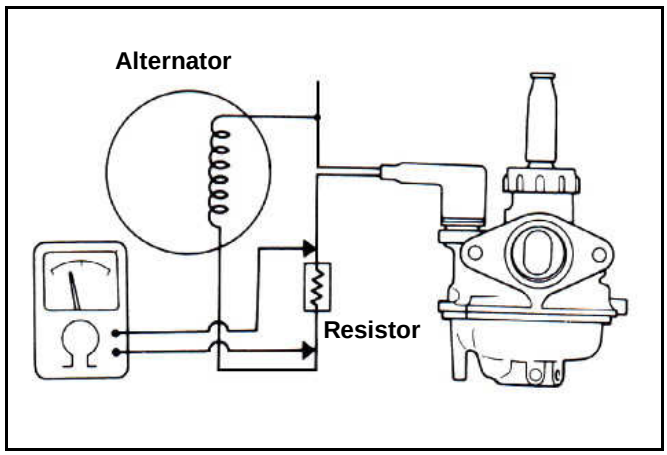
Remove carburetor, and allow it to cool off for 30 minutes.
Connect fuel rich circuit with a hose and pump compressed air to the hose.
Air should flow into fuel rich circuit.
Replace the auto by-starter if the circuit clogged.



Connect battery to starter's connectors and wait for several minutes.
Pump compressed air into the fuel rich circuit.
Air should not flow into the circuit.
If air flow through the circuit; then replace the auto-by starter.

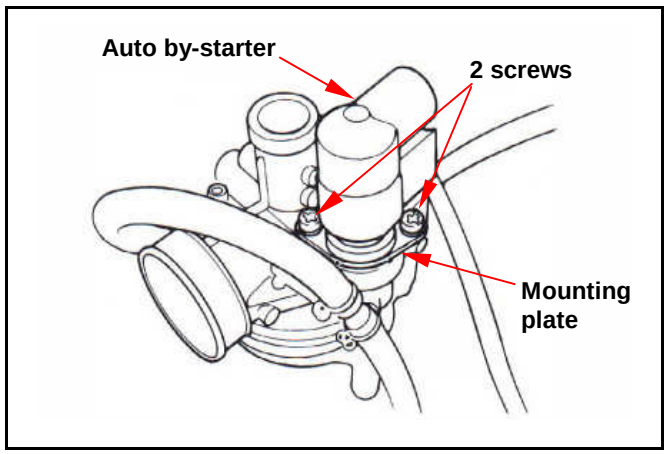


Check resistor to make sure that the auto by-starter is in normal. Engine is running.
If the resistor is in open-circuit, then current will not flow into the PTC. Thus, the auto by-starter is not operated.
However, if the resistor is in short-circuit; current higher than specification will flow into the PTC. Then, it will cause the fuel rich circuit close rapidly, and difficult to start the scooter.
Resistance value: 10.2Ω



Auto By-Starter Removal/Installation

Remove the cover of the auto by-starter.
Remove screw and mounting plate.
Remove the auto by-starter from carburetor.
Install in the reverse order of removal procedures.



Float/Float Valve/Jet

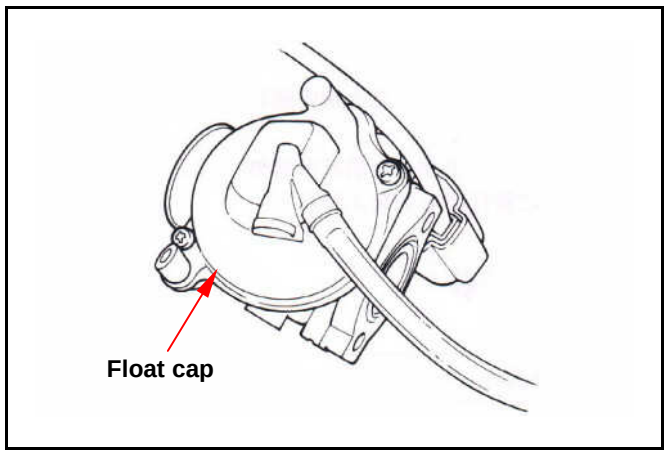
Removal

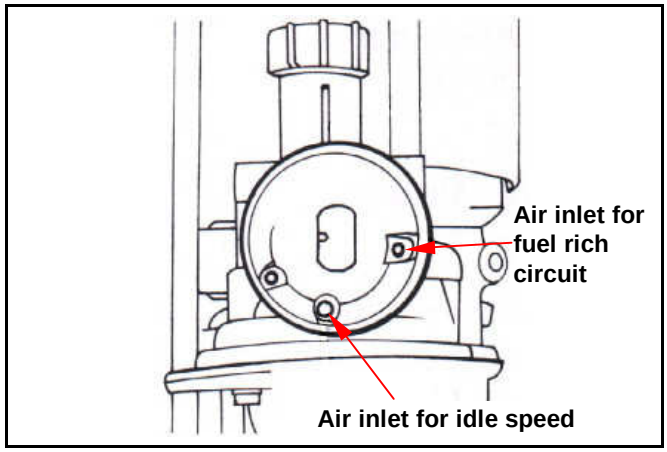
Remove the float from carburetor body.
Remove the float pin and then remove float and float valve.
Check the valve seat for worn out or damage.
Check float for bend and if fuel inside the float.
Before removing both the throttle valve stopper and air screws, record their original turns for close to their original set up position as installation.

⚠ Caution

Do not tighten the screw forcedly to avoid to damaging the valve seat.

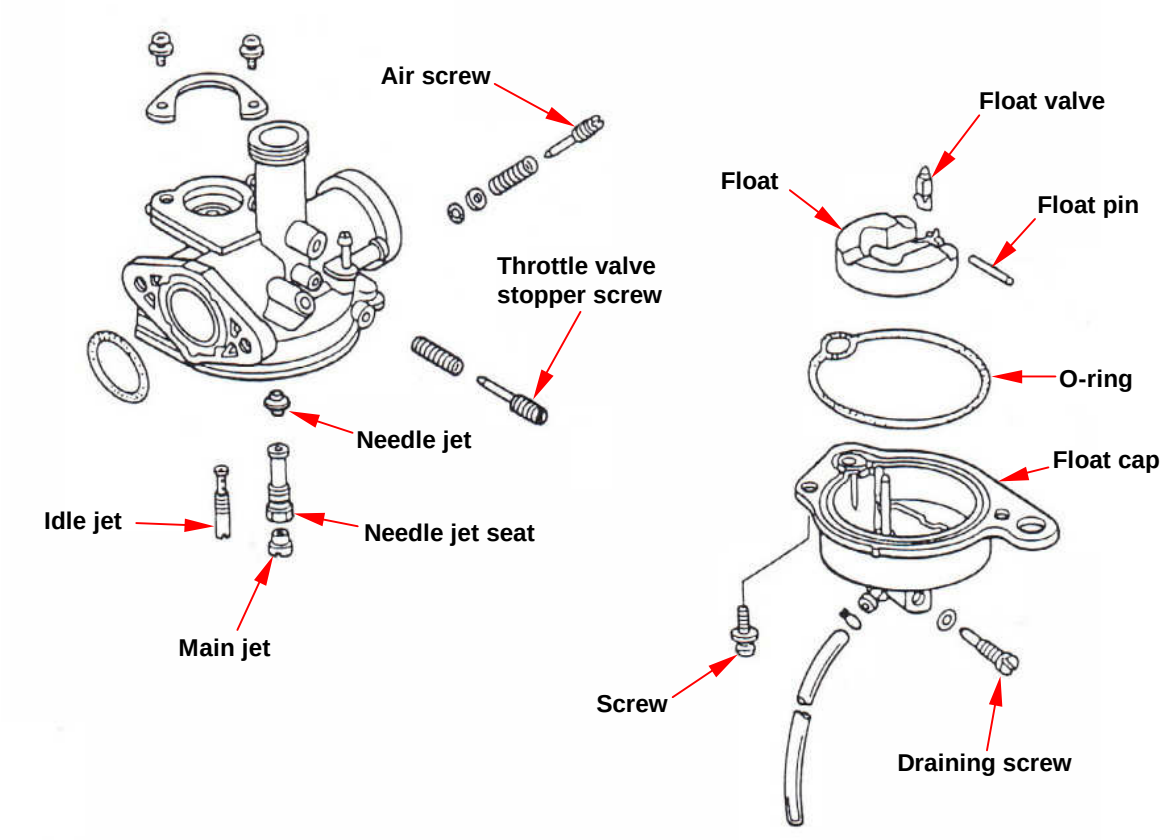
Remove main jet, needle jet seat and idle jet and clean them and each component with compressed air.





Installation

Install the idle jet, the needle jet seat and main jet. Then install the throttle valve stopper and air screws to their original position according to the marks as removal. Adjust the screws if replace with new ones.



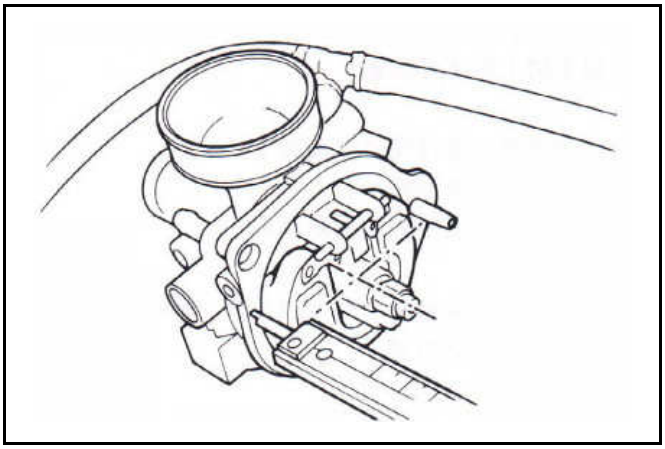
Float Level Inspection

Measures float fuel level to have the upper end of float just contact with the float.

Float fuel level: 8.8 mm

Carefully bend the float arm for adjustment.

Check the float operation and the install it.



Carburetor Installation

⚠ Caution

Do not let foreign materials into the carburetor.

Install the carburetor and insulator onto intake pipe with bolts.

Install fuel and vent pipes onto carburetor.

Install the carburetor upper part.

Tighten the connection hose.

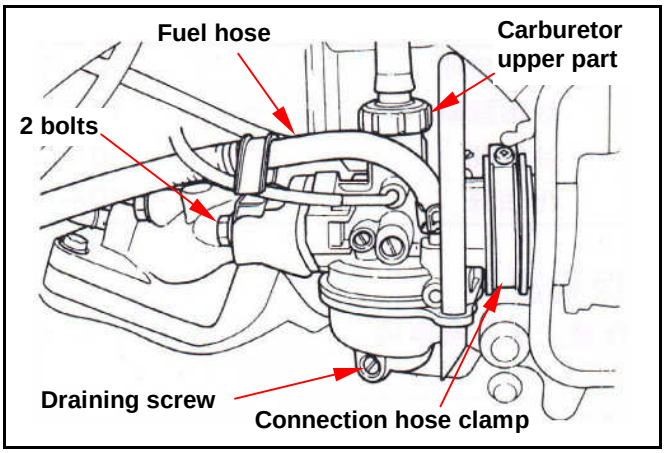
Tighten the draining screw.

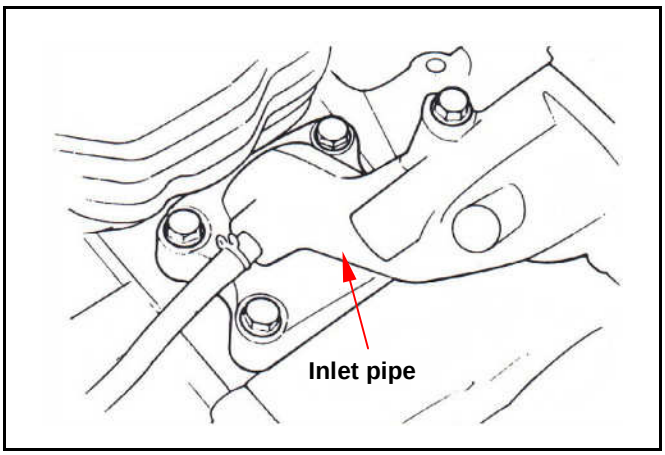
Connect the automatic by-starter connector.

Install air cleaner cap.

Conduct following operations

- Adjustment of throttle valve cable.
- Adjustment of oil pump.
- Adjustment of idle speed.





Reed Valve

Removal

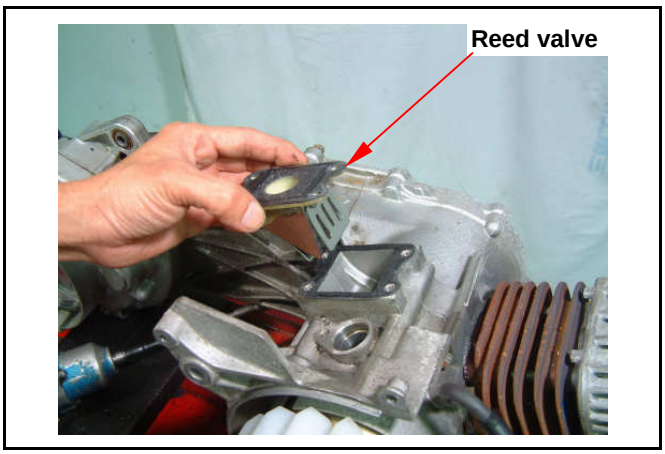
Remove the luggage box.

Remove the carburetor.

Remove carburetor insulator.

Remove inlet pipe.

Remove the reed valve.

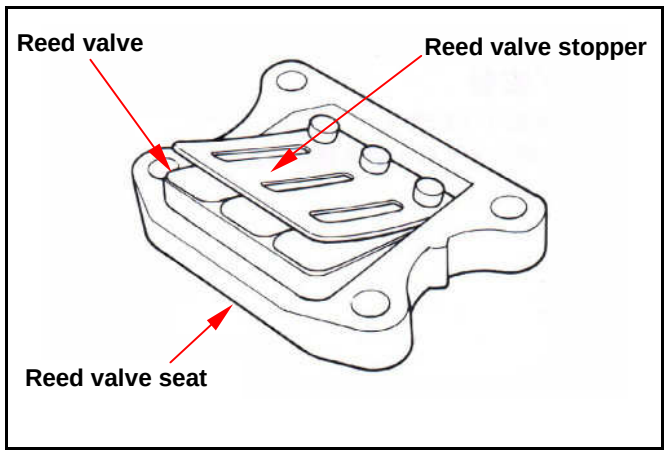


Inspection

Check the reed valve for damage and its reed strength.
Check the reed valve seat for crack, damage and the clearance between the seat and the valve.
Replace reed valve if necessary.

⚠ Caution

Do not bend the reed valve stopper. Otherwise, it will cause its strength insufficient and rough engine running. If the reed valve or its seat is damaged, replace with a set.



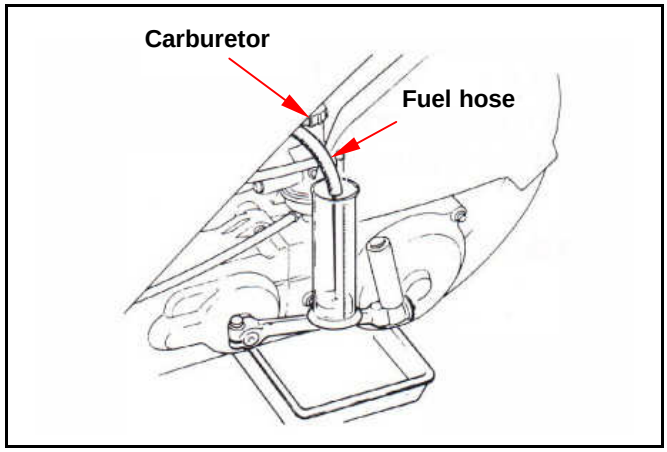
Installation

Install in the reverse order of removal procedures.
Check for leaking after installed.

Fuel Pump

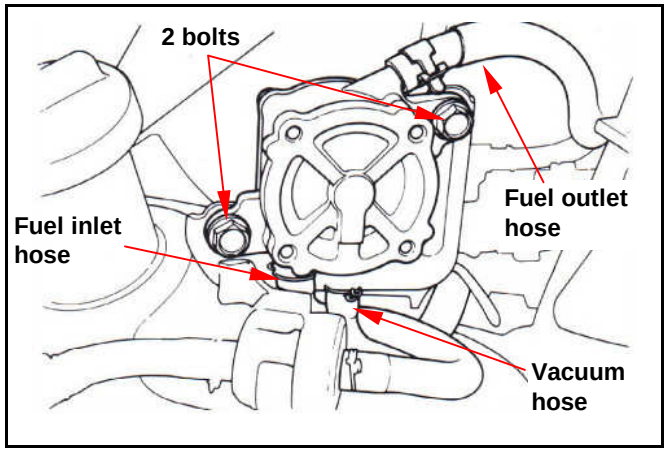
Inspection

Remove the rear side cover.
Warm up the engine and adjust idle speed.
Remove fuel hose from carburetor and then wait for 5 minutes.
Measure the output of fuel pump. Its output time is 10 seconds.
Output quantity: Min. 20 c.c.
If the output quantity is lower than 20c.c., check fuel hose, vacuum hose and fuel filter.



Removal/Installation

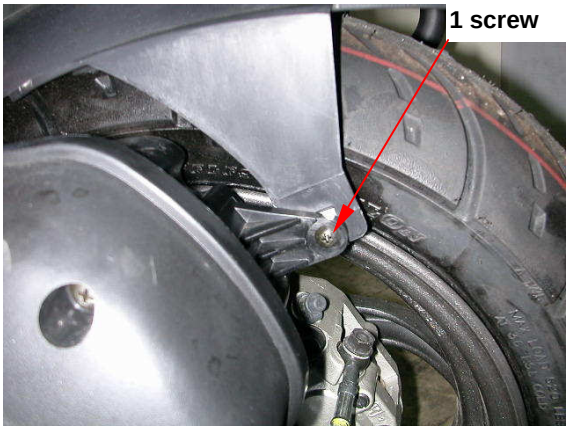
Remove floor plate.
Remove fuel inlet, outlet and vacuum hoses.
Remove 2 bolts and fuel pump.
Install the fuel pump in the reverse order of removal procedures.



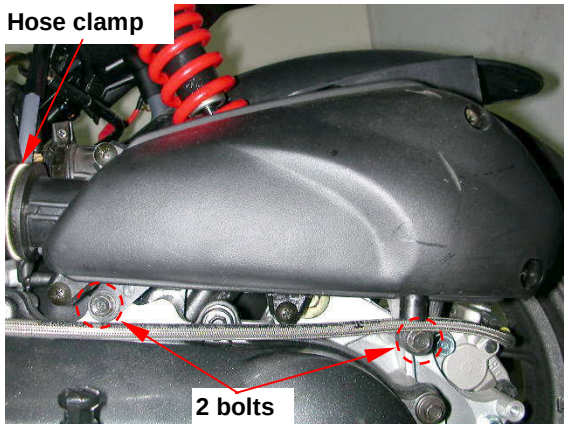
Air Cleaner

Removal/Installation

Remove air cleaner and rear inner fender mounting screw.



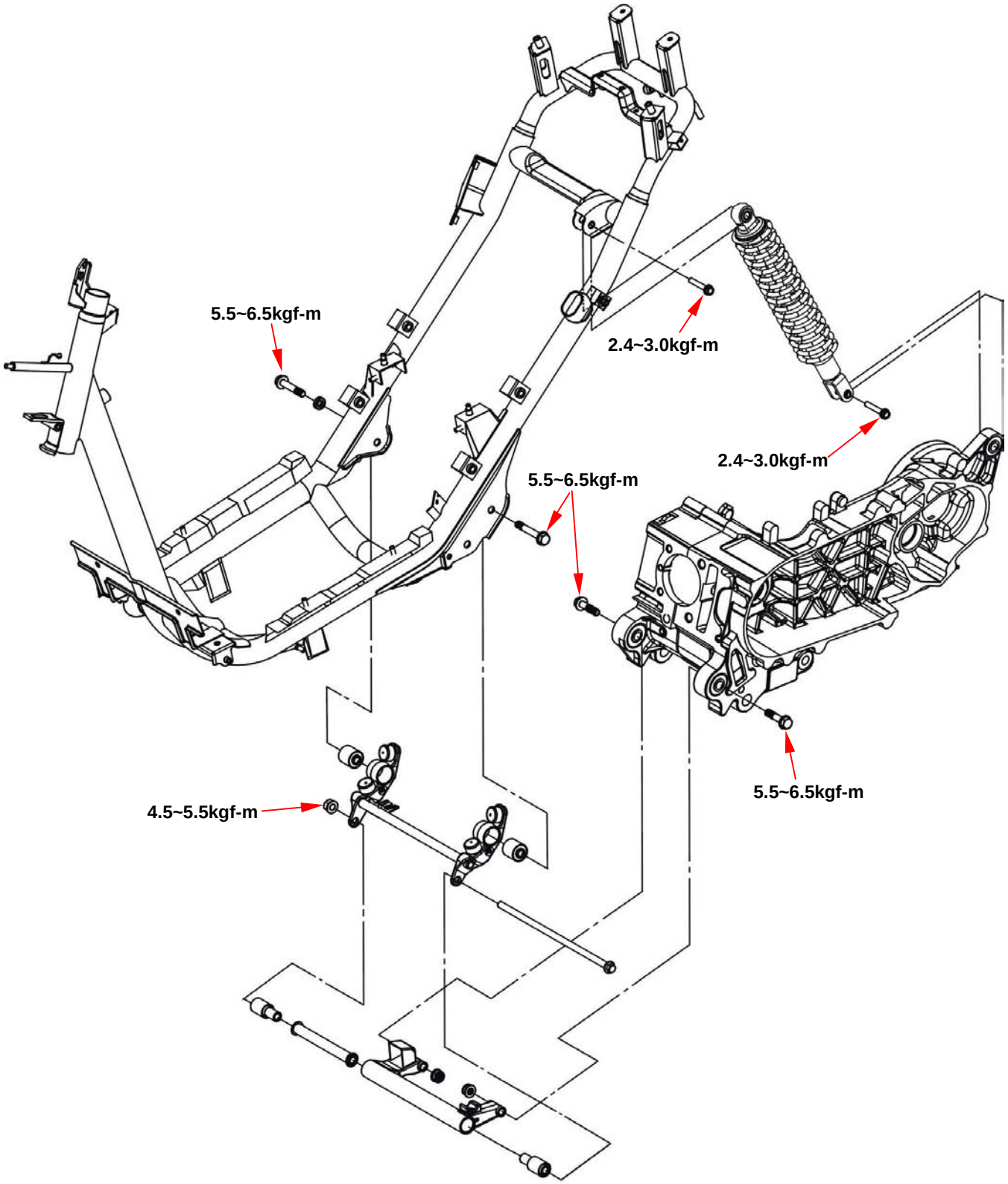
Loosen connection hose clamp.
Remove 2 bolts and then remove the air cleaner.



Install in the reverse order of removal procedures.

Notes:

Maintenance Information ····· 5-2	Engine installation ····· 6 5
Engine removal ····· 5-3	



5. Engine Removal

Maintenance Information

There are parts that require removal of engine for maintenance.

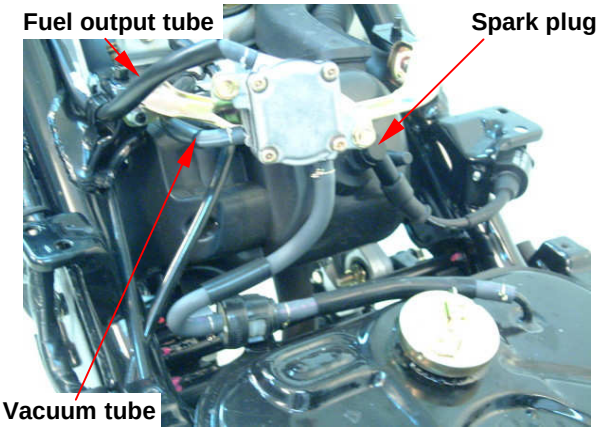
- Crankcase
- Crankshaft

Related bolts tightening torque for removal of engine:

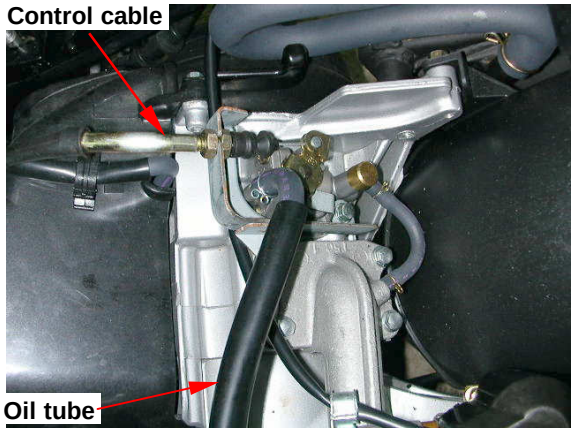
Engine hanger bolt	5.5~6.5kgf-m
Engine hanger bracket bolt	4.5~5.5kgf-m
Rear cushion upper mounting bolts	3.5~4.5kgf-m
Rear cushion lower mounting bolts	2.4~3.0kgf-m
Exhaust pipe connection nut	1.0~1.4kgf-m
Muffle mounting bolt	3.0~3.5kgf-m

Engine removal

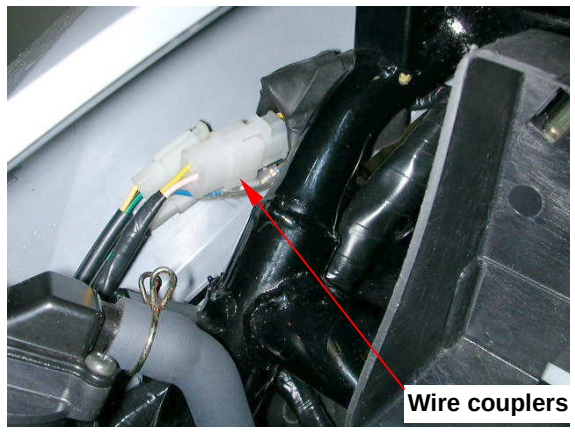
Remove body cover.
Remove the spark plug cap from the spark plug.
Remove the fuel output and the vacuum tubes from fuel pump.



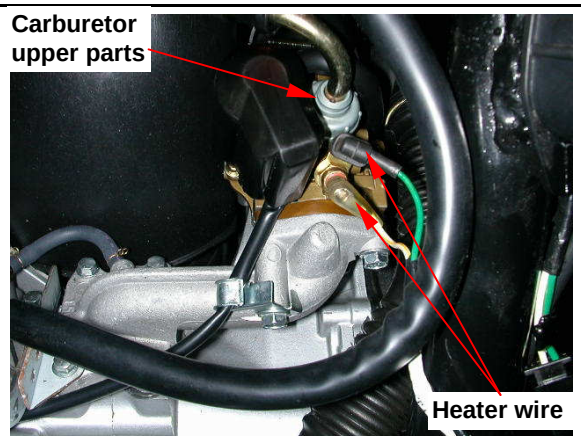
Remove the oil control cable from oil pump.
Remove the oil tube from oil pump and then clip the tube.



Remove the wire couplers of auto by starter and ACG.

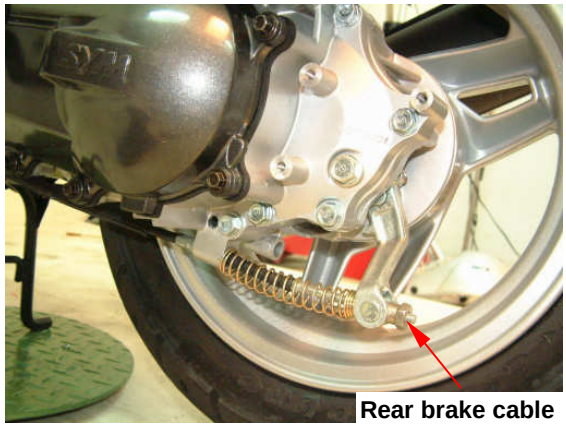


Remove the upper parts of the carburetor from its upper side.
Remove the carburetor heater electric wire.



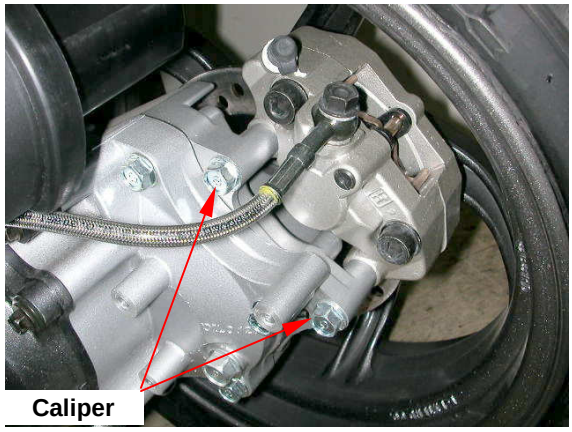
Drum type rear brake

Remove rear brake cable from engine rear-lower side.
Remove brake cable from cable clamp.

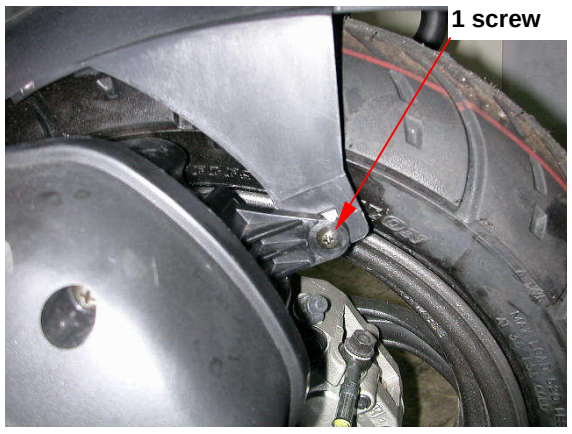


Disc type rear brake

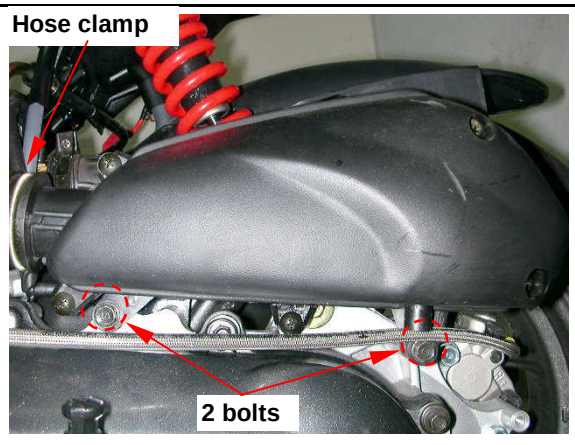
Remove rear brake caliper (2 bolts) from engine rear-upper side.
Remove brake hose from hose clamp.



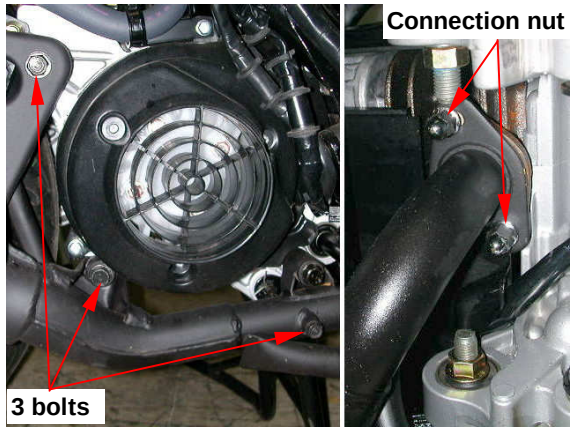
Remove air cleaner and rear inner fender mounting screw.



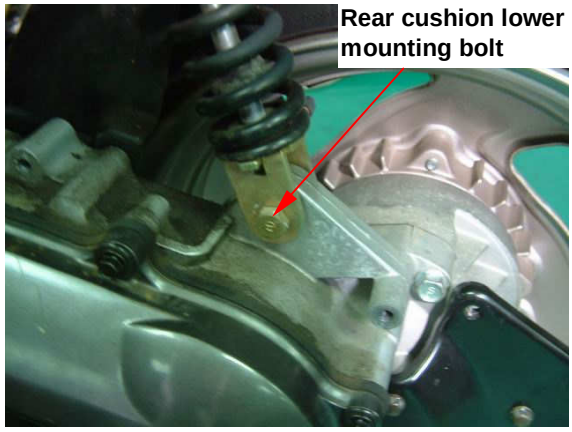
Loosen connection hose clamp.
Remove 2 bolts and then remove the air cleaner.



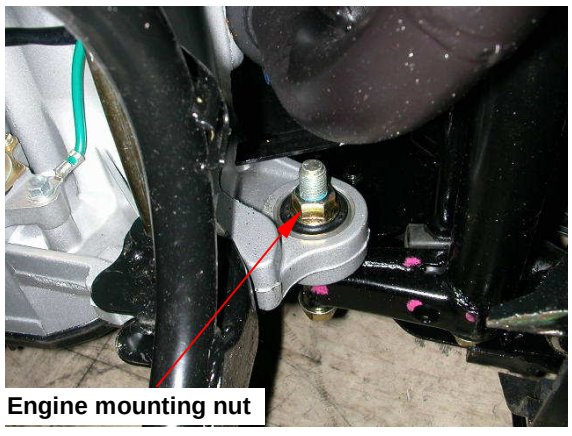
Remove two exhaust pipe connection nuts.
Remove two bolts beside fan cover and exhaust pipe.

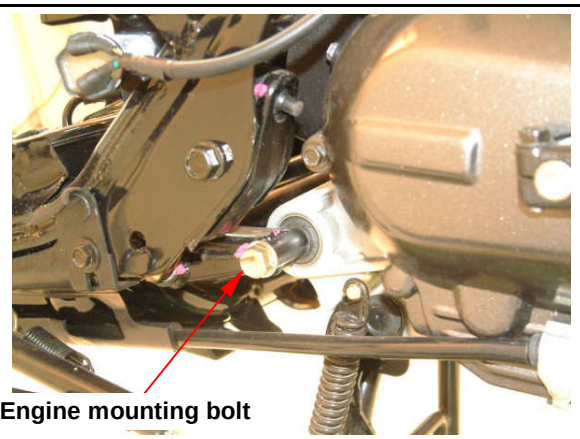


Support the engine and then remove cushion lower mounting bolt.



Remove engine mounting nut and bolt. (Each side 1 bolt and 1 nut)
Remove the engine.

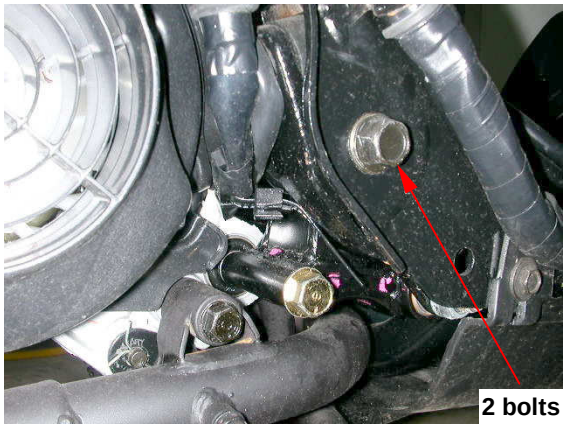




Engine Hanger Bracket

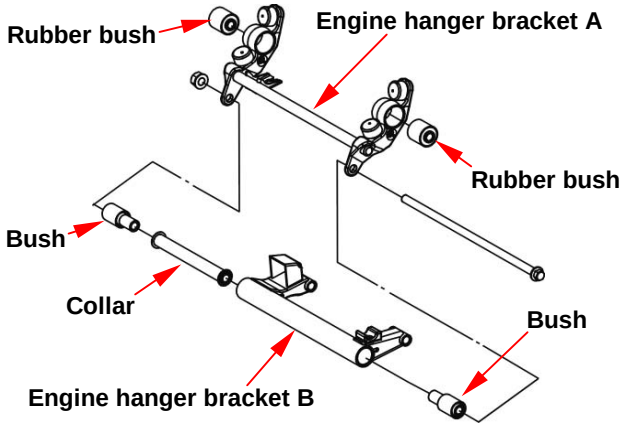
Removal

Remove the frame side right and left side bolts of engine hanger bracket. (1 bolt on each side)



Disassembly

Remove the engine hanger bracket nut and bolt.
Disassembly engine hanger bracket A and engine hanger bracket B.
Check if the engine hanger rubber bushes, hanger bushes and collar for damage. If so, replace with new ones.



Assembly

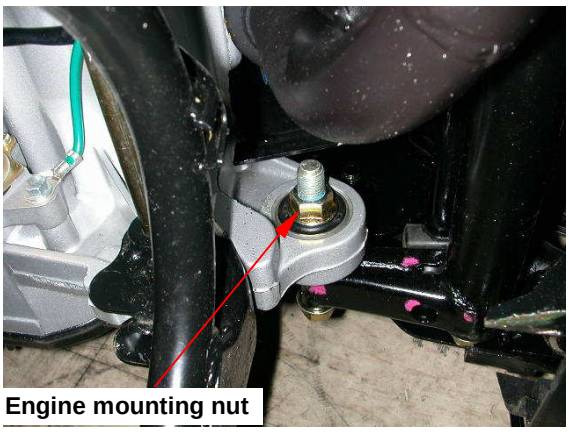
Install hanger bushes and collar into engine hanger bracket B.
Install engine hanger bracket A and engine hanger bracket B and tighten the bolts and nuts of engine hanger bracket.
Torque Value: 4.5~5.5kgf-m

Engine installation

Install in the reverse order of removal procedures.
Tighten the engine mounting bolts and rear cushion upper/lower bolts.

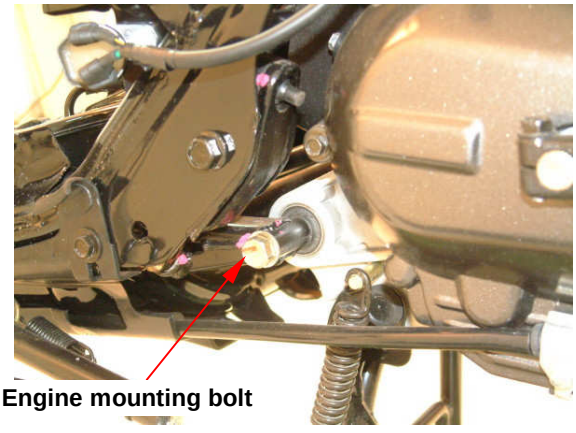
Torque value:

Engine hanger bolt	5.5~6.5kgf-m
Rear cushion upper mounting bolts	3.5~4.5kgf-m
Rear cushion lower mounting bolts	2.4~3.0kgf-m
Exhaust pipe connection nut	1.0~1.4kgf-m
Muffle mounting bolt	3.0~3.5kgf-m

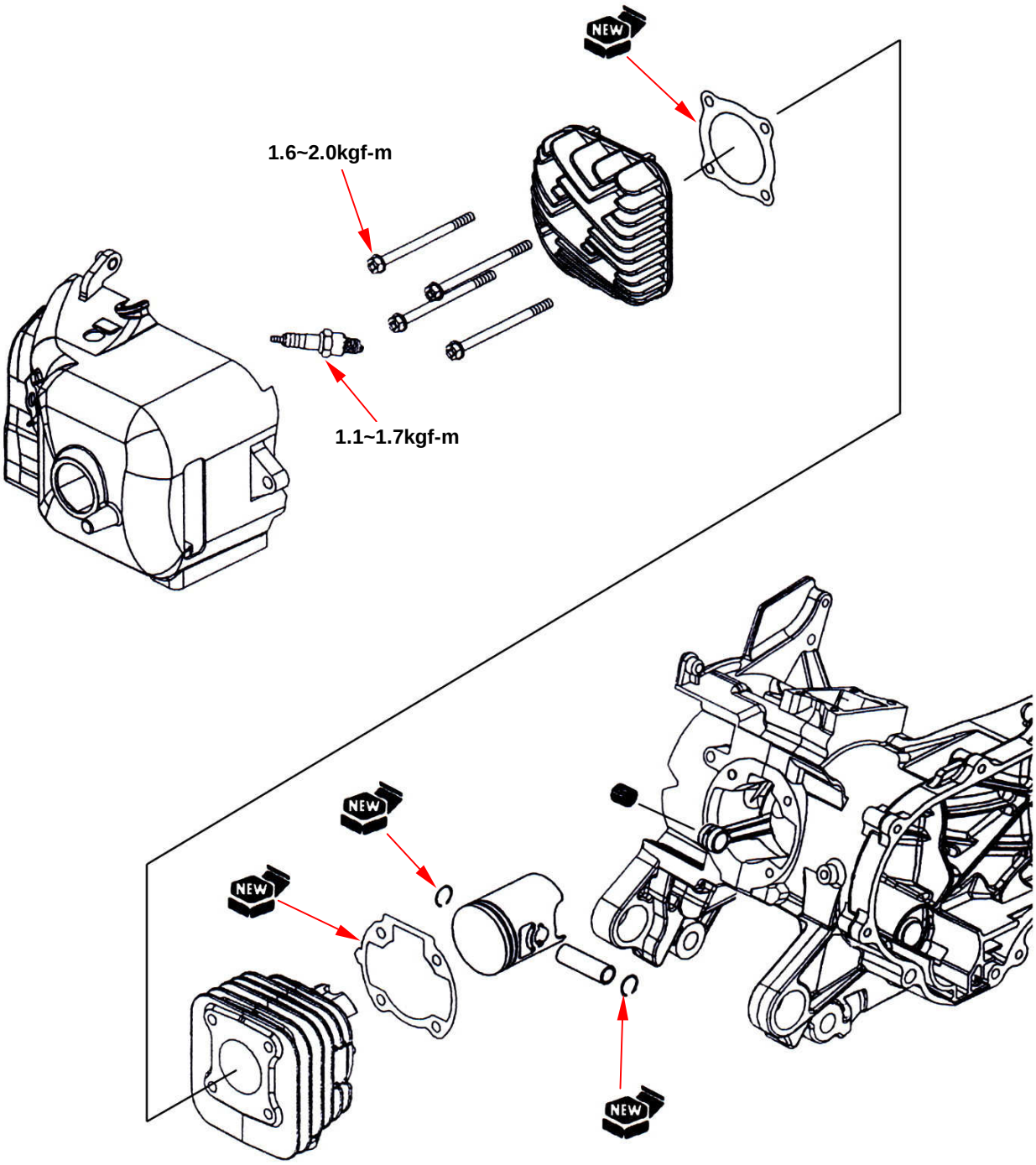


Perform the following inspection and adjustment after installation.

- Check if control cable is correct.
- Check if throttle valve cable is correct.
- Check if oil pump control cable is correct.
- Oil input and output of the oil pump.
- Adjust rear brake.



Maintenance Information ····· 6-2	Cylinder Head ····· 6-3
Troubleshooting ····· 6-2	Cylinder/Piston ····· 6-5



6. Cylinder Head/Cylinder/Piston

Maintenance Information

Precautions in Operation

- The inspection and maintenance of the cylinder head, cylinder and piston can be carried as engine mounted on the body.
- It should clean the engine to prevent dirt from entering into cylinder and crankcase before removal.
- Remove all washes from the interfaces of cylinder head, cylinder and crankcase.
- Be careful do not damage cylinder head, cylinder and piston when removing.
- Inspect the removed & cleaned parts thoroughly, and apply with oil onto the rotation surfaces before installation.

Specification

Item		Jet Sport X 50 series	
		Standard value (mm)	Limit (mm)
Cylinder head	Deformation	-	0.100
Piston	Piston OD	39.030~39.045	38.935
	Clearance between cylinder and piston	0.040~0.050	0.100
	Piston pin hole	12.002~12.008	12.030
	Piston pin OD	11.994~12.000	11.970
	Clearance between piston and piston pin	0.002~0.014	0.030
	Piston ring end gap	0.100~0.250	0.400
	ID of connecting rod small end	17.05~17.015	17.025
Cylinder	ID	39.000~39.015	39.050
	Deformation	-	0.100

ID: inner diameter OD: outer diameter

Tighten torque value

Cylinder head	1.6~2.0kgf-m
Spark plug	1.1~1.7kgf-m
Exhaust pipe connection nut	1.0~1.4kgf-m
Exhaust muffler mounting bolt	3.0~3.6kgf-m

Troubleshooting

Compression Pressure Too Low/Difficult To Start/Rough Idling

1. Cylinder head gasket leaking
2. Spark plug not tighten enough
3. Worn, seized or crack piston ring
4. Damaged, worn cylinder or piston
5. Poor reed

Compression Pressure Too High/Overheat/Knock

1. Too much carbon deposit built up in combustion chamber

Piston Noise

1. Cylinder and piston worn out
2. Piston pin or piston pin hole worn out
3. Connecting rod small end bearing worn out

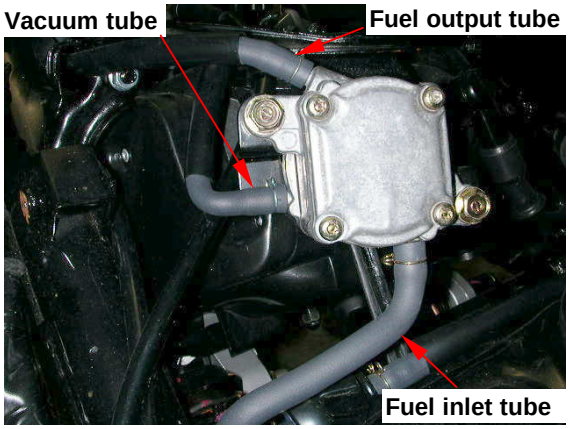
Piston Ring Noise

1. Worn, seized or crack piston ring
2. Cylinder worn out or damaged

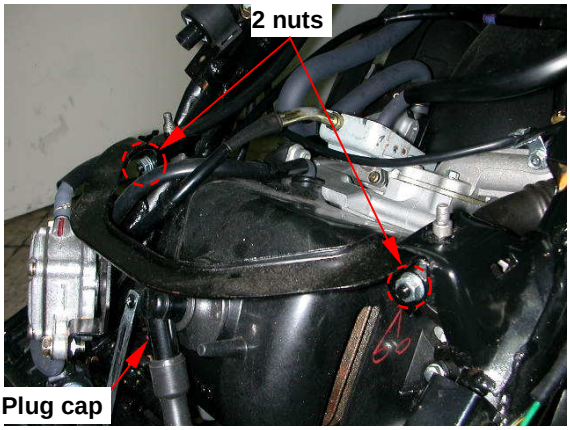
Cylinder Head

Cylinder Head Removal

Removal luggage box, body covers and center cover.
Remove fuel pump tubes.

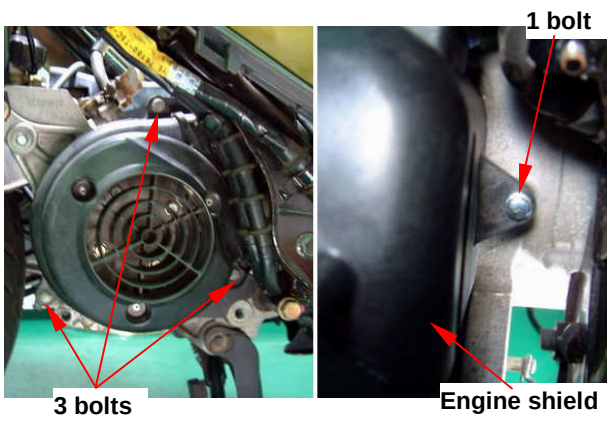


Remove spark plug cap.
Remove fuel pump bracket (2 nuts).

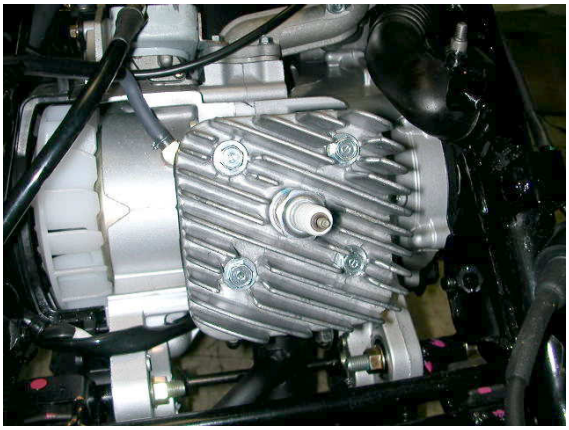


Remove vacuum tube and oil pump control cable from engine shield.

Remove fan cover (3 bolts).
Remove engine shield mounting bolt (1 bolt).



Remove engine shield.

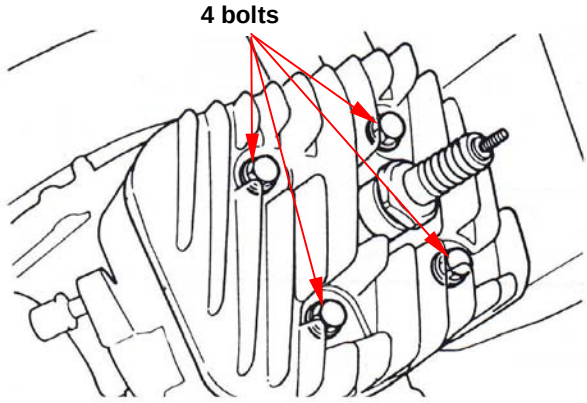


Cylinder Head Removal

Remove spark plug.
Remove the 4 cylinder head bolts and then remove the cylinder head.

⚠ Caution

Loosen the cylinder head bolts with diagonal direction to avoid to damaging it.

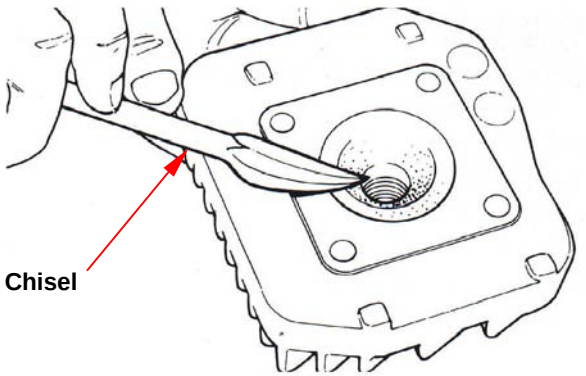


Cleaning Carbon in Combustion Chamber

Clean carbon deposit in which built up in combustion chamber with shown chisel.

⚠ Caution

Do not scratch to the interfaces of combustion chamber and cylinder.



Cylinder Head Inspection

Use a straight edge and a feeler gauge to measure the cylinder head for warp.

Service limit: 0.10 mm

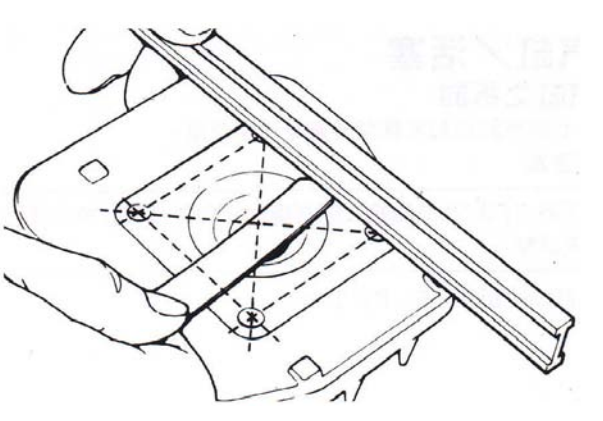
Cylinder Head Installation

Replace the cylinder head gasket with new one, and place the cylinder head onto cylinder.
Tighten the 4 bolts with diagonal direction and by 2-3 sequences.

Tighten torque: 1.6~2.0kgf-m

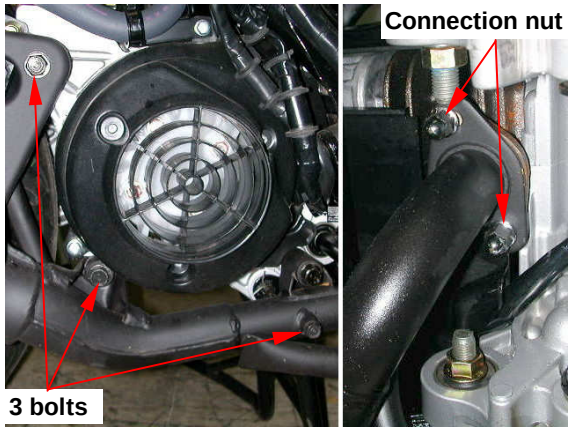
Install spark plug

Tighten torque: 1.1~1.7kgf-m



Cylinder/Piston

Remove spark plug cap.
Remove fan cover.
Remove engine shield.
Remove two connection nuts of the exhaust pipe.
Remove exhaust muffle mounting bolt, and then remove the exhaust muffler.

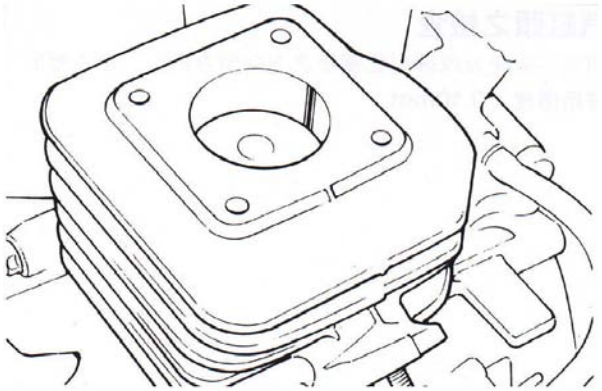


Cylinder Removal

Remove cylinder head.
Be careful to pull the cylinder up and prevent piston from damage.

⚠ Caution

Do not have pry out operation between cylinder and crankcase. Or let radiation fan be knocked seriously.

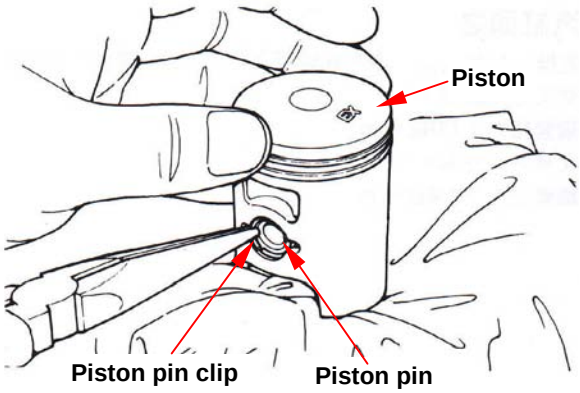


Piston Removal

Place a clean rag onto crankshaft to cover the piston.
Remove piston pin clip (one piece) and then push piston pin out the piston.

⚠ Caution

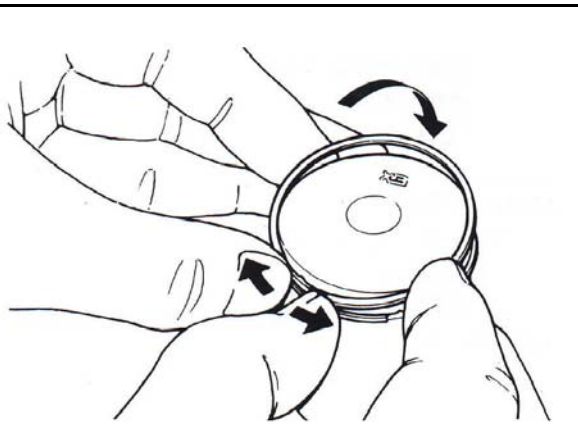
- Do not damage or scratch the piston.
- Do not apply with lateral force to connecting rod.
- Do not let piston pin snap ring falling into crankcase.



Piston Ring Removal

⚠ Caution

Pry out the opening end of each piston ring and then remove the ring from piston.

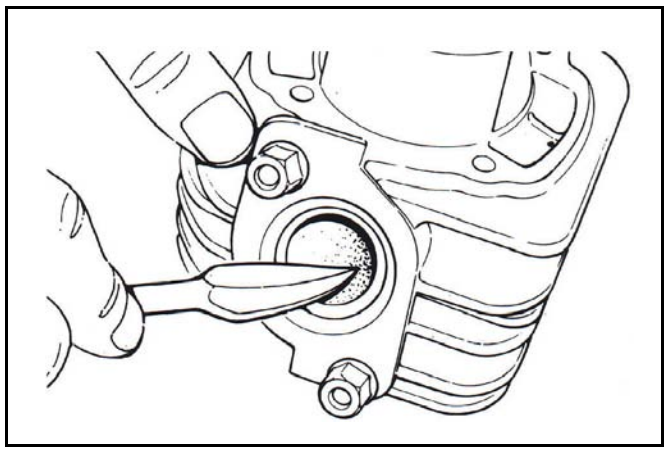


6. Cylinder Head/Cylinder/Piston

Check if cylinder and piston are worn or damaged, and then clean carbon deposit on exhaust opening area as the diagram shown.

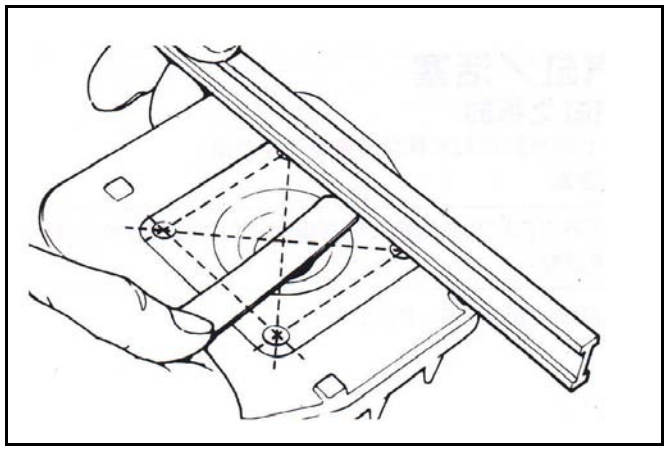
⚠ Caution

Do not scratch both the cylinder and the piston.



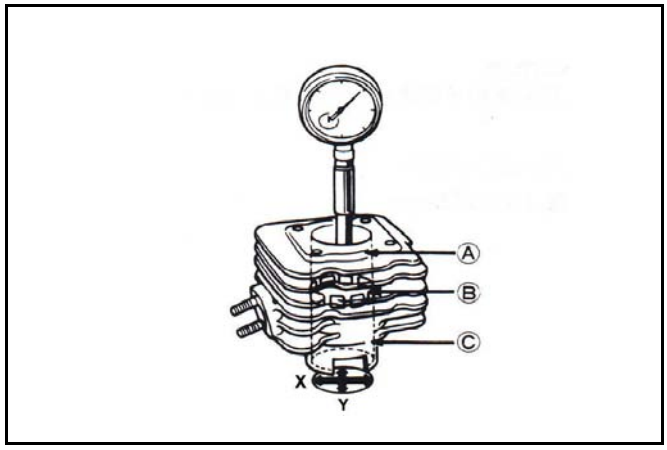
Use a straight edge and a feeler gauge to measure the cylinder head for warp.

Service limit: 0.10 mm



In “X” and “Y” direction, measure the cylinder for worn out as the three levels shown in the figure. With the maximal value to decide cylinder wear out condition.

Service limit: 39.050mm

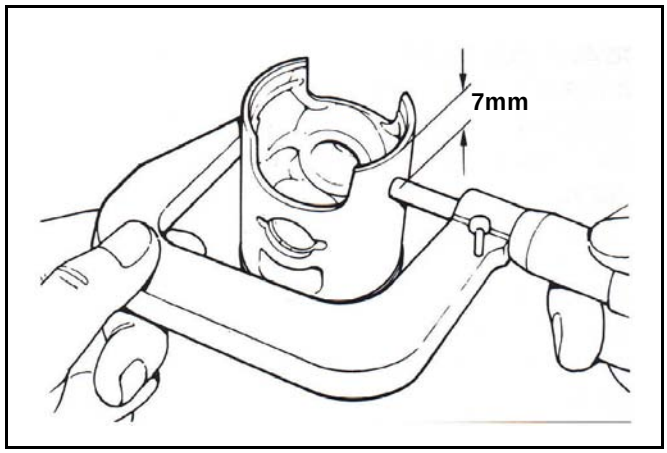


Measure the OD of piston at the 7 mm from the bottom of the piston.

Service limit: 38.935 mm

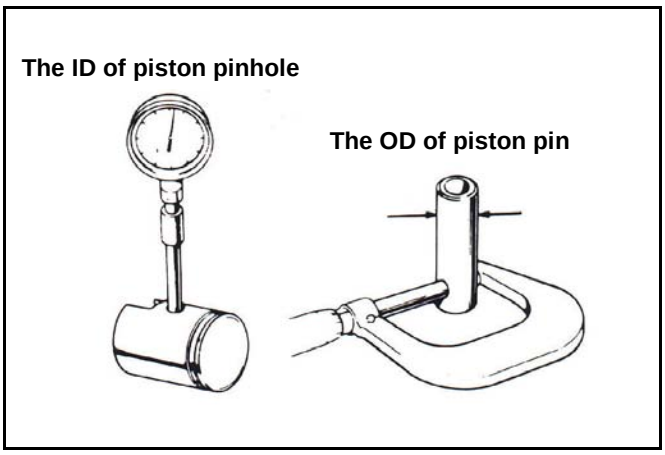
Calculate the clearance between piston and cylinder.

Service limit: 0.100 mm



Measure the piston pinhole ID of piston.
Service limit: 12.030mm

Measure the OD of piston pin.
Service limit: 11.970 mm

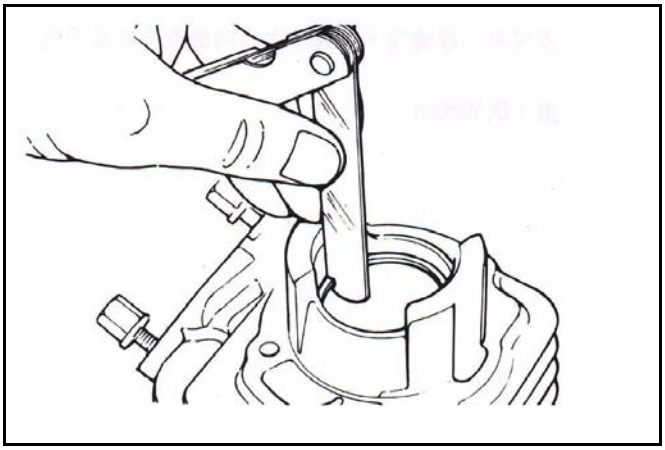


Piston Ring Inspection

Measure the end gap of each piston ring.
Service limit: 0.40 mm

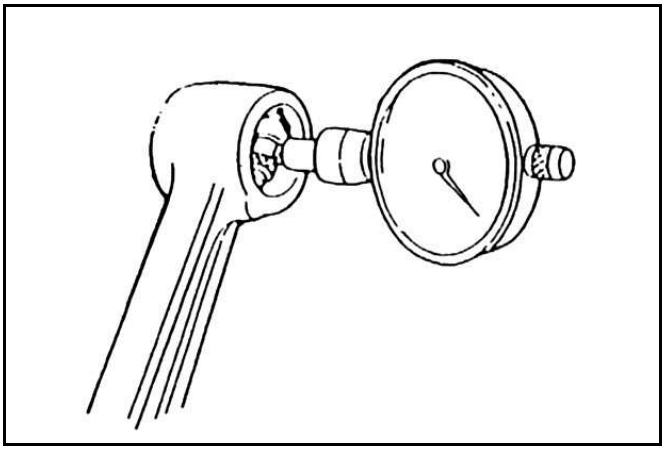
⚠ Caution

With the piston, push each piston ring into cylinder correctly.

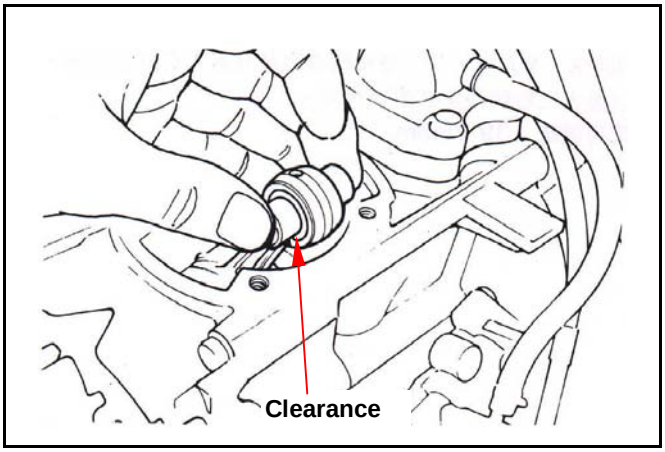


Connecting Rod Inspection

Measure the ID of connecting rod small end.
Service limit: 17.025mm

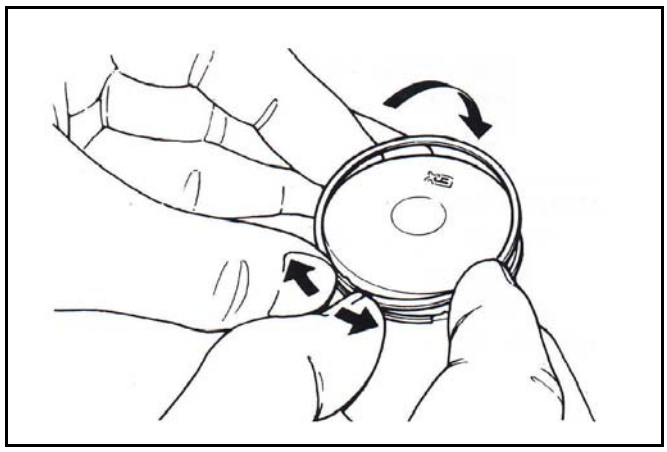


Install bearing and piston pin onto connecting rod small end, and then check its clearance.



Piston/Cylinder Installation

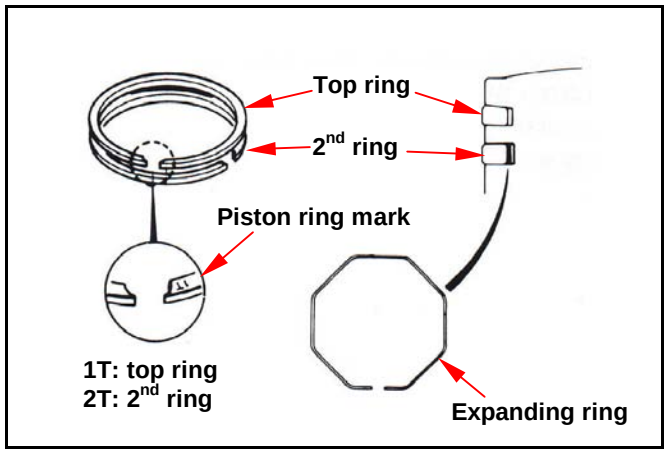
Install the expanding ring into the groove of 2nd ring.
Align the ring end with the lock pin in the ring groove.
Install the top ring and the 2nd ring onto the ring groove respective.



⚠ Caution

The top ring and the 2nd ring cannot be changeable each other.

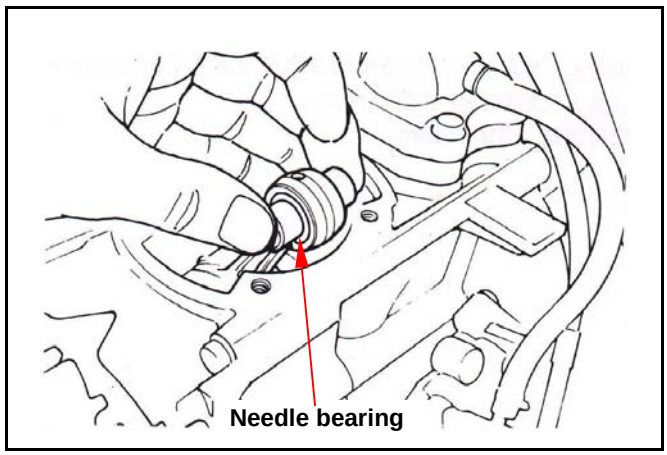
Push the rings into ring groove and then check rings' mating condition.
If ring could not be push in the ring groove, it means that ring groove is dirty or wrong ring groove installation.



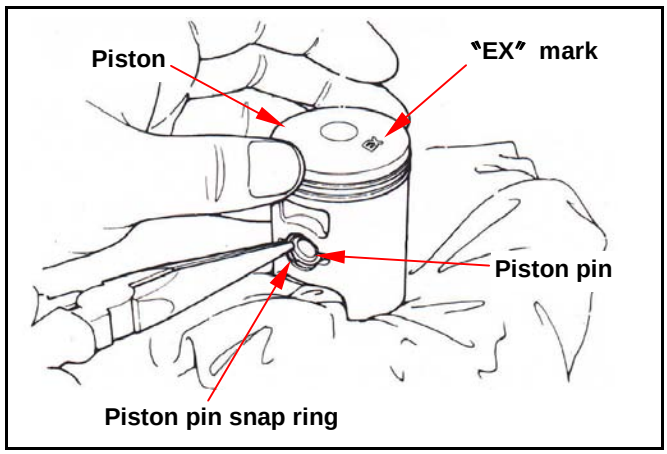
⚠ Caution

- All rings should be installed with the marks facing up.
- All rings should be replaced at same time, and it cannot be replaced one ring only.
- It should use same brand name piston ring in an engine and cannot mix with other one.

Place a cleaning cloth onto the crankcase opening to prevent the piston pin snap ring from falling into the crankcase.
Apply with two-stroke engine oil onto needle bearing and piston pin, and install needle bearing into connecting rod small end.
Install piston, and place "EX" mark of the piston toward to exhaust side, and then install the piston pin onto piston and connecting rod.



Install new piston pin snap ring.
Clean all gaskets onto the interfaces of cylinder and crankcase.
Place a new gasket onto the crankcase.
Make sure that the piston ring aligns with the lock pin in piston ring groove.



⚠ Caution

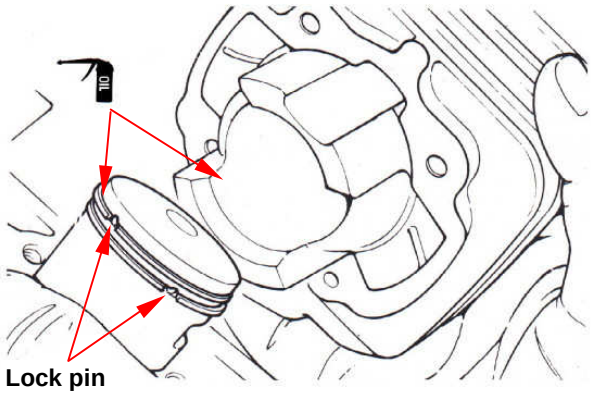
Make sure that all rings in the piston ring groove cannot be rotated around the lock pin to avoid to damaging the rings, piston and cylinder.

6. Cylinder Head/Cylinder/Piston

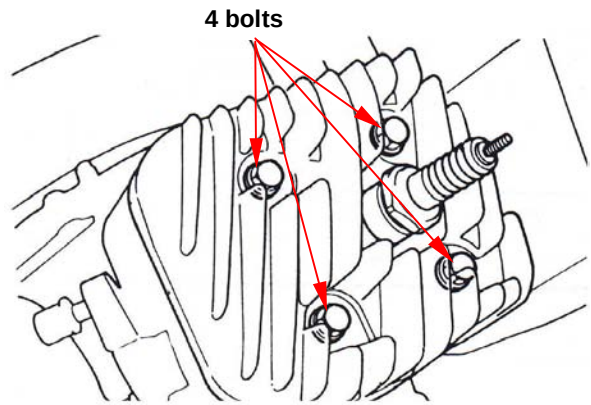
Lubricate cylinder and piston with two-stroke engine oil.
Hold the piston and then install it into cylinder.

⚠ Caution

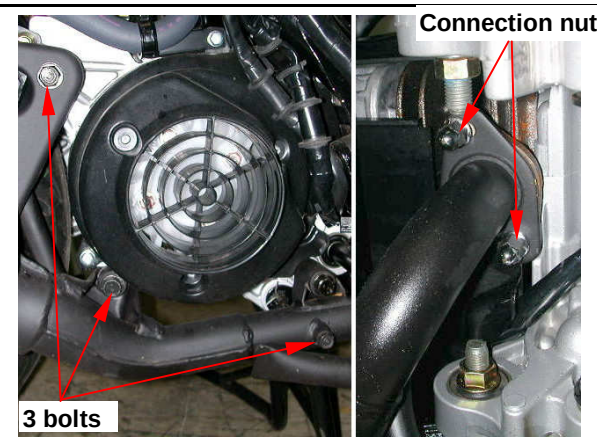
To avoid to damaging the piston and the cylinder sliding surface.



Install the cylinder head.
Tighten torque: 1.6~2.0kgf-m



Replace the exhaust pipe washer with new one and then install exhaust pipe.
Tighten exhaust pipe connection nut.
Tighten torque: 1.0~1.4kgf-m
Tighten exhaust pipe mounting bolt.
Tighten torque: 3.0~3.6kgf-m
Install the removed parts in the reverse order of removal procedures.
Inspect following item after installation.
Test engine compression pressure.
Check for engine noise.



Note:

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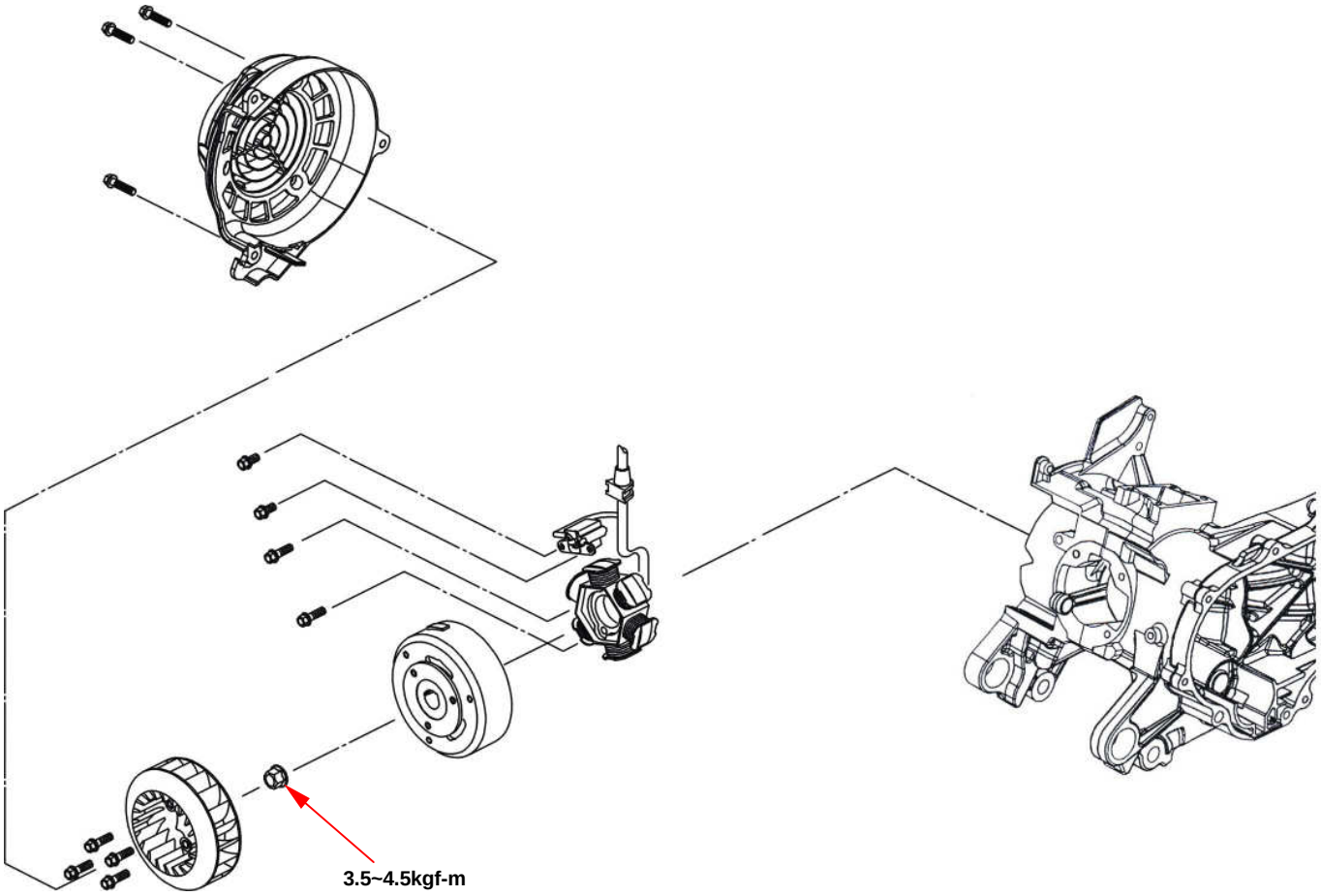
Generator Removal ····· 7-3
Generator Installation ····· 7-4



Maintenance Information

Precautions in Operation

- The maintenance service of A.C. generator can be carried out directly on the scooter.
- Please refer to Chapter 15 for the relative A.C. generator inspection.

Torque value:

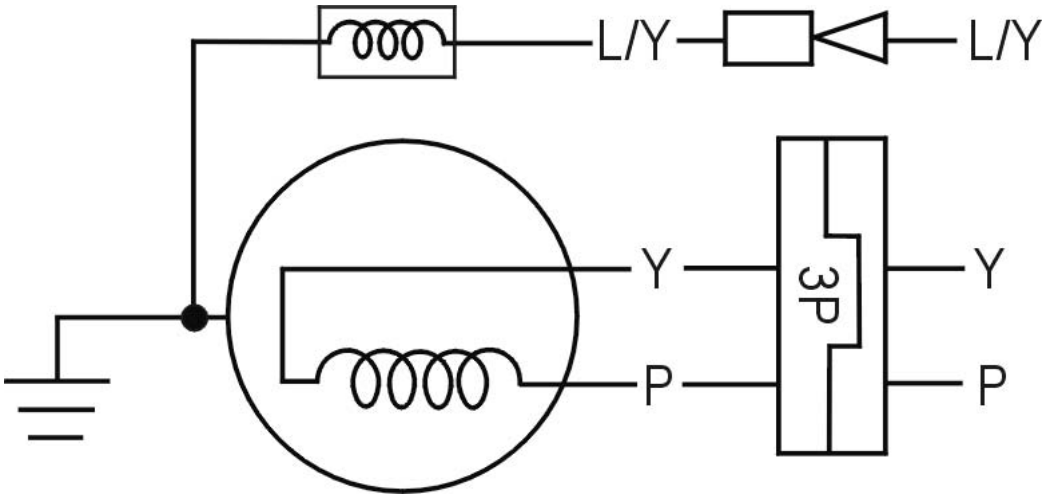
Flywheel 3.5~4.5kgf-m

Special Service Tools:

Flywheel puller SYM-3110A01
Universal holder SYM-2210100

Coil resistance value for the A.C. generator

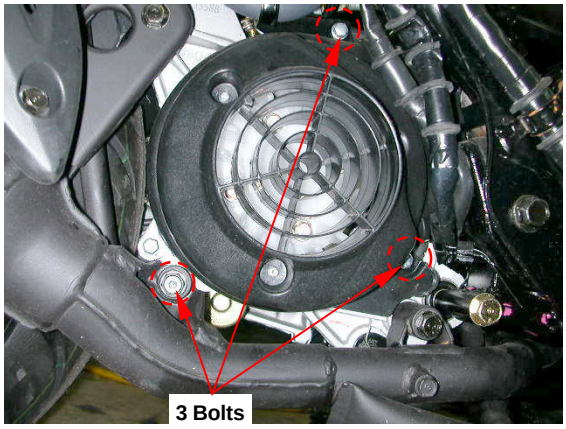
	Y/L	Y	P	Earth
Y/L				50~200Ω
Y			0.2~0.8Ω	
P		0.2~0.8Ω		
Earth	50~200Ω			



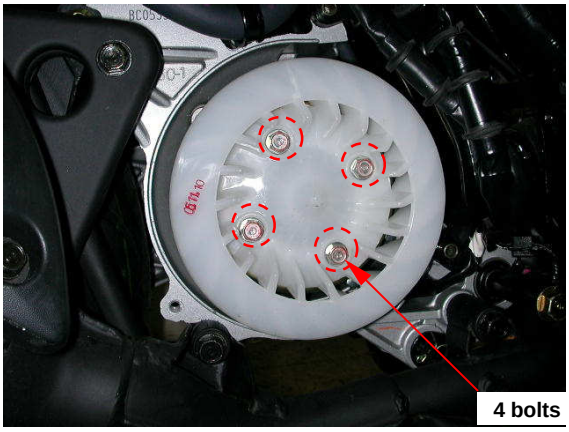
AC. generator

Generator Removal

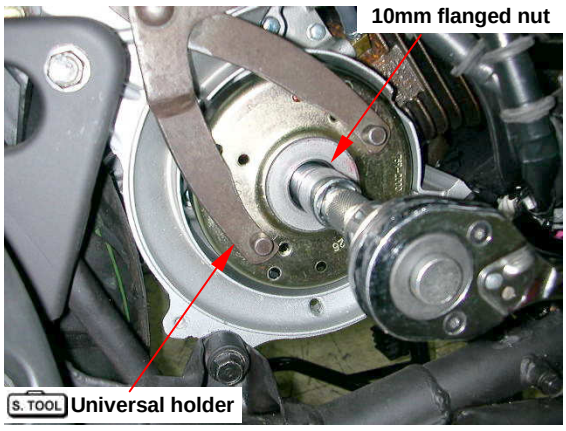
Remove the luggage box and rear side cover.
Remove 3 bolts and then take out cooling fan cover.



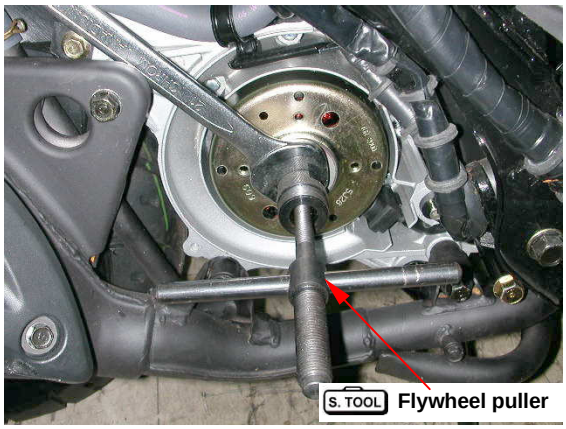
Remove 4 bolts, and then take out the cooling fan.



Hold flywheel with universal holder.
Support the flywheel and the remove the 10 mm nut on the flywheel.
Special tool:
Universal holder SYM-2210100

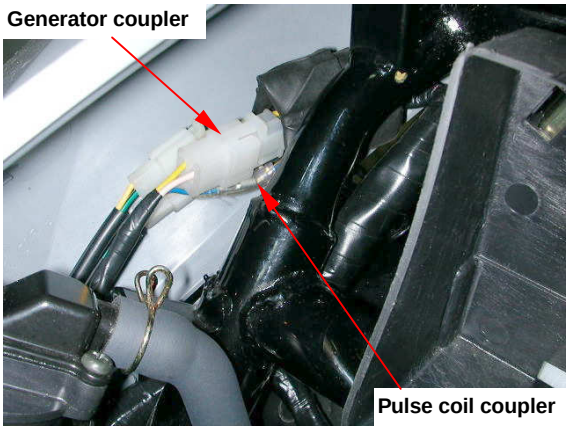


Remove the flywheel with flywheel puller.
Special tool:
Flywheel puller SYM-3110A01



7. A.C. Generator

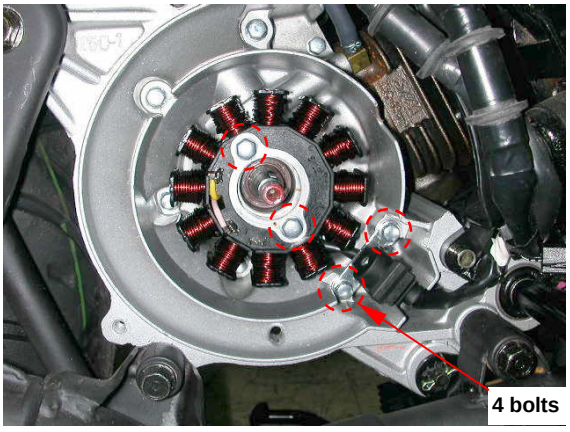
Disconnect generator wire coupler and pulse coil coupler.



Remove the pulse coil and generator coil bolts (4 bolts), and then take out the generator assembly.

⚠ Caution

Care to be taken for not damaging the generator coil.



Generator Installation

Install the generator assembly.
Connect the generator coupler.

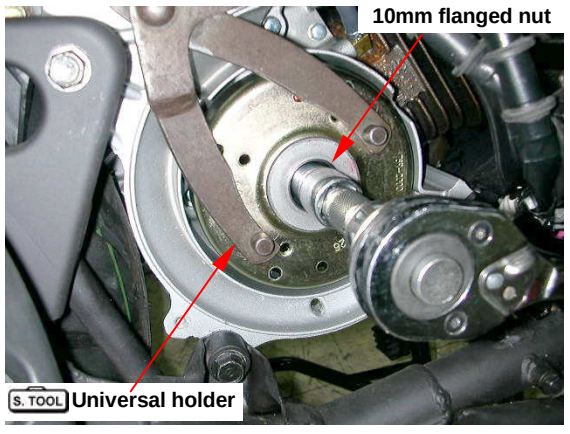
⚠ Caution

Connect the generator wire harness properly and then clip the harness with clipper.

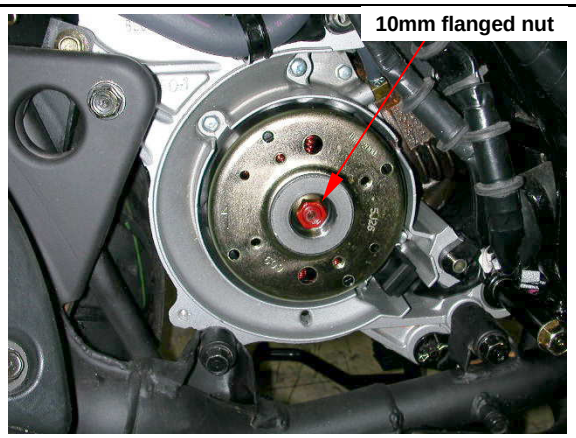
Install the woodruff key onto the crankshaft groove.

⚠ Caution

- Clean dirt and metal pieces inside the flywheel.
- Make sure that there is no foreign material inside the flywheel.



Install the flywheel.
Tighten the flywheel 10 mm nut.
Torque value: 3.5~4.5kgf-m
Install the removed parts in reverse order of removal procedures.
Start engine and check its ignition timing.



8. "V" Type Belt Drive System/Kick-Starter

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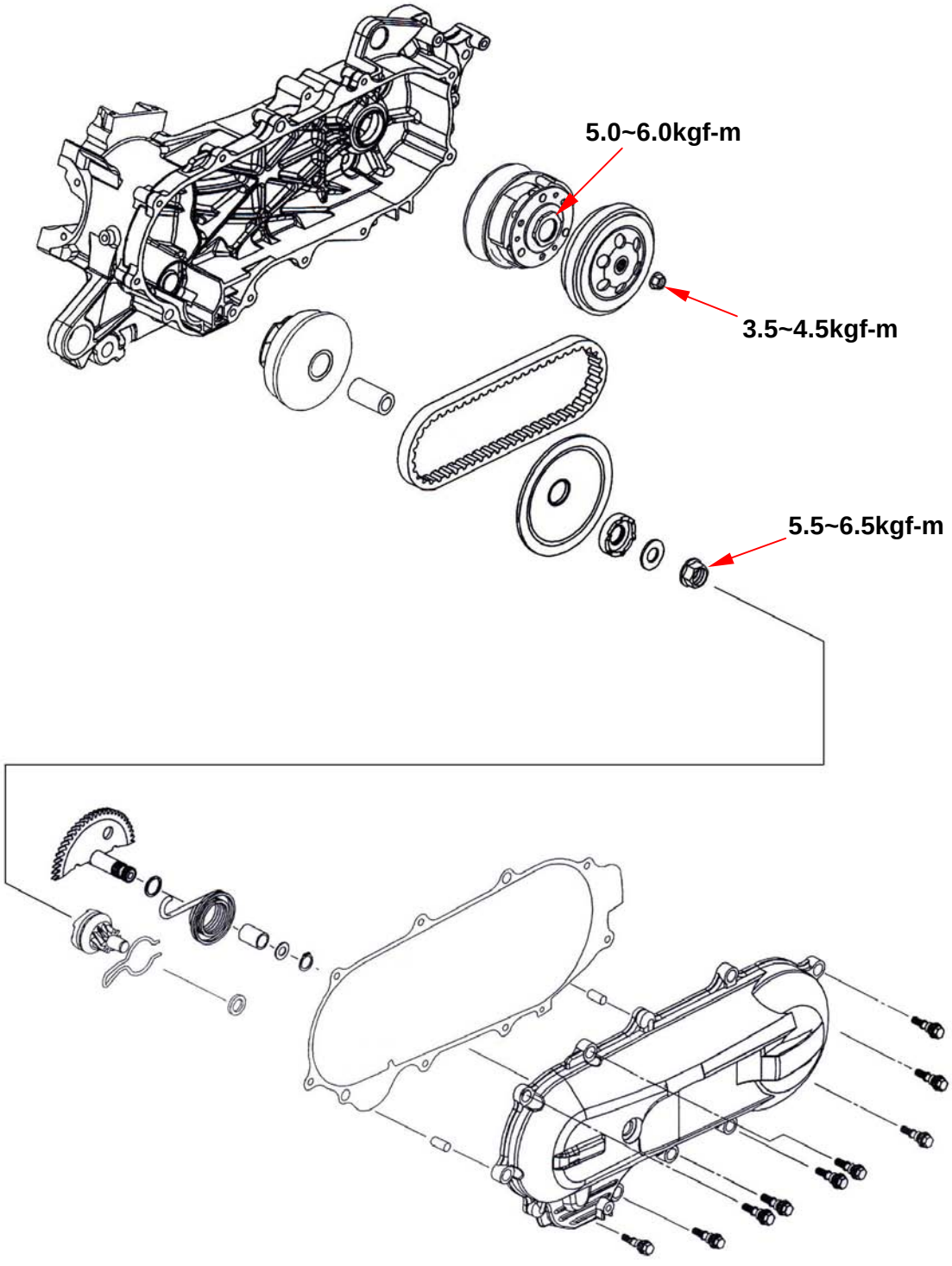
Reassembly Of Kick Starter ····· 8-5
Installation Of The Left Crankcase Cover ····· 8-5
Drive Belt ····· 8-6
Movable Driven Pulley ····· 8-7
Clutch/Driven Pulley ····· 8-1



Maintenance Information

Precautions In Operation

The surfaces of drive belt and driven pulley must be free of grease.

Specification

Item	Standard value (mm)	Limit (mm)
Drive belt width	**18.0**	**16.5**
ID of movable drive face	**20.035~20.085**	**20.120**
OD of movable drive face boss	**23.964~23.985**	**23.918**
OD of weight roller	**15.92~16.08**	**15.40**
ID of clutch outer	**107.0~107.2**	**107.5**
Thickness of clutch weight	**4.0~4.1**	**2.0**
Free length of driven pulley spring	**87.9**	**82.5**
OD of driven pulley	**33.965~33.985**	**33.940**
ID of movable driven face	**33.000**	**34.060**

ID: Inner Diameter
OD: Outer diameter

Torque Values:

Movable drive face	5.5~6.5kgf-m
Driven pulley plate	5.0~6.0kgf-m
Clutch outer	3.5~4.5kgf-m

Special Service Tools

Clutch spring compressor	SYM-2301000
Clutch nut wrench	SYM-9020200
Universal holder	SYM-2210100
Inner bearing puller	SYM-6204020
Clutch bearing driver	
Clutch seal driver	

Trouble Shooting

Engine can be started but motorcycle cannot be moved

1. Worn drive Belt
2. Worn ramp plate
3. Worn or damaged clutch weight
4. Broken driven pulley spring

Shudder or misfire when drive

1. Broken clutch weight
2. Worn clutch weight

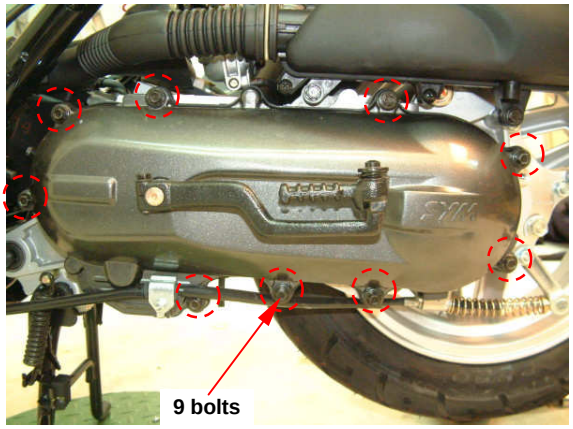
Insufficient horsepower or poor high-speed performance

1. Worn drive belt
2. Insufficient spring capacity of driven pulley
3. Worn weight roller
4. Driven pulley operation un-smoothly

Left Crankcase Cover

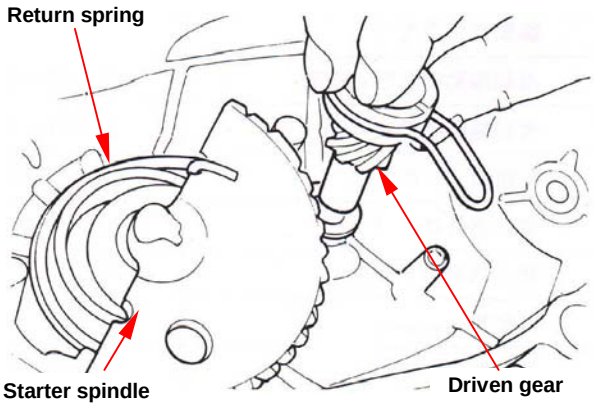
Left crankcase cover removal

Remove rear left body side cover.
Remove air cleaner (2 bolts).
Remove kick-start arm (1 bolt).
Remove left crankcase cover (9 bolts).



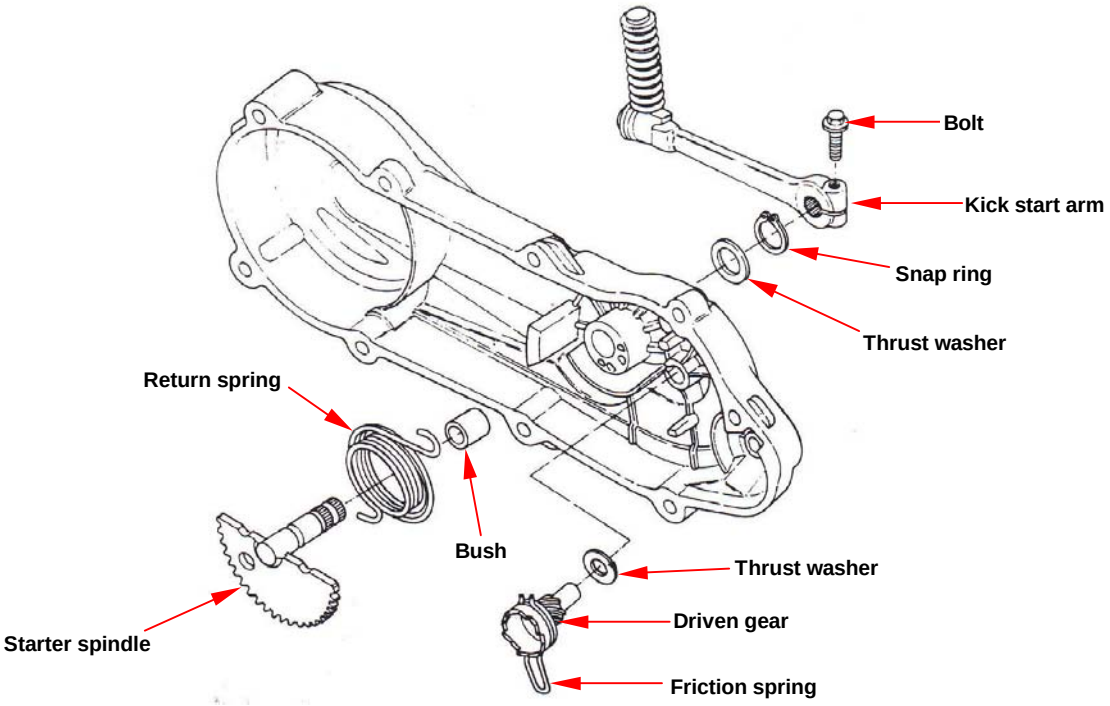
Disassembly of Kick Starter

Remove snap clip and thrust washer from left crankcase cover.
Install kick-start arm, rotate the lever slightly and then remove driven gear and washer.
Remove the kick-starter arm, kick starter spindle, and return spring as well as socket.



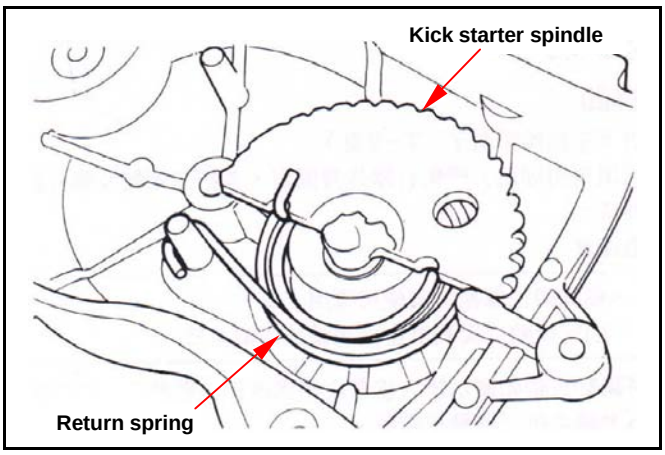
Inspection of kick Starter

Check if starter spindle, driven gear for wear or damage.

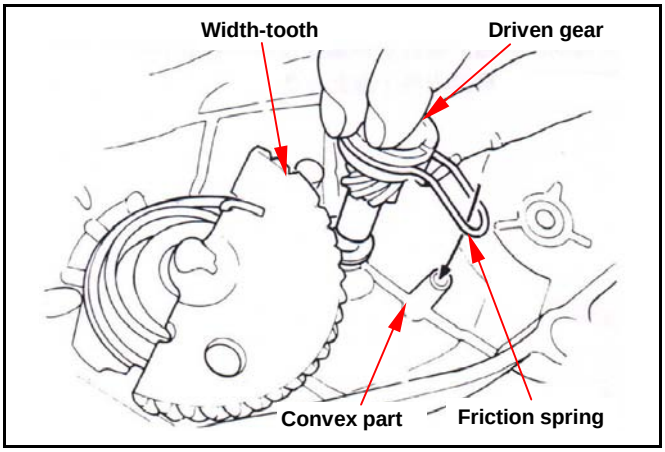


Reassembly of Kick Starter

Install bush, return spring and starter spindle as diagram shown.
Install thrust washer and snap clip onto starter spindle.

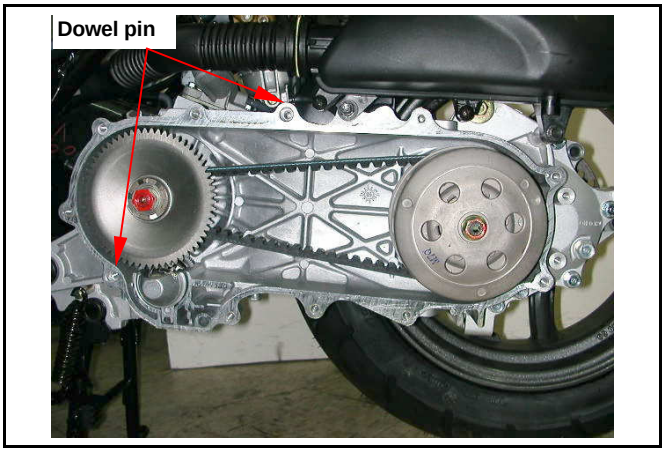


Install kick-starter lever temporary.
Slightly rotate the lever and then align driven gear with width-tooth on the starter spindle.
Install the friction spring of drive gear onto convex part of the cover.

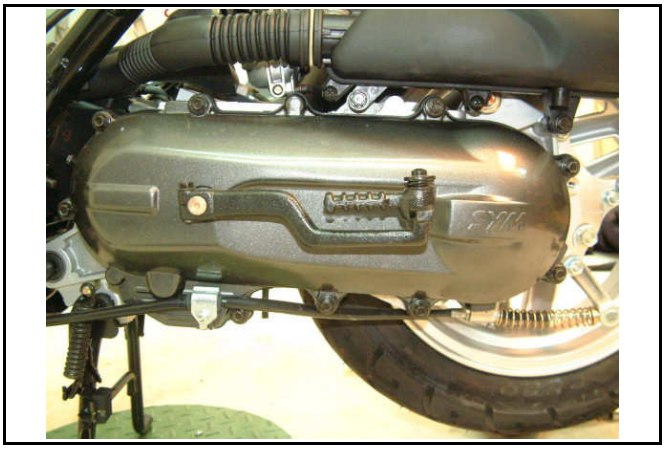


Installation of the Left Crankcase Cover

Install the dowel pin and gasket.
Install the left crankcase cover.



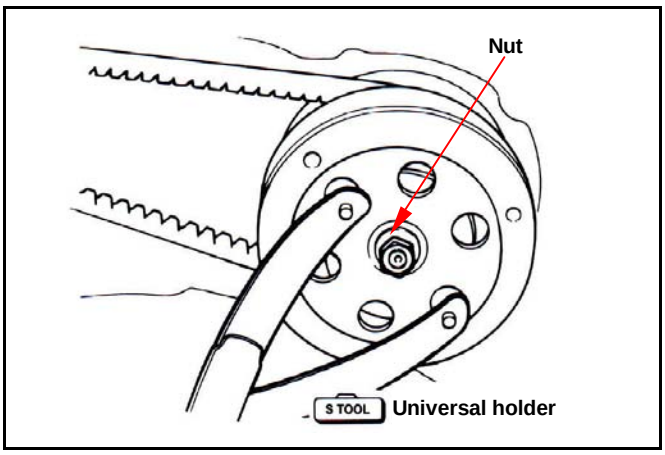
Install kick-start arm.



Drive Belt

Removal

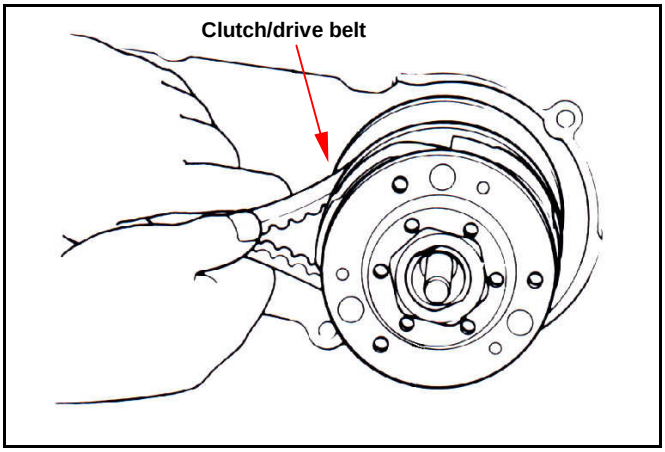
Remove left crankcase cover.
Hold clutch outer with universal holder, and remove nut and clutch outer.
Special tool:
Universal holder SYM-2210100



Caution

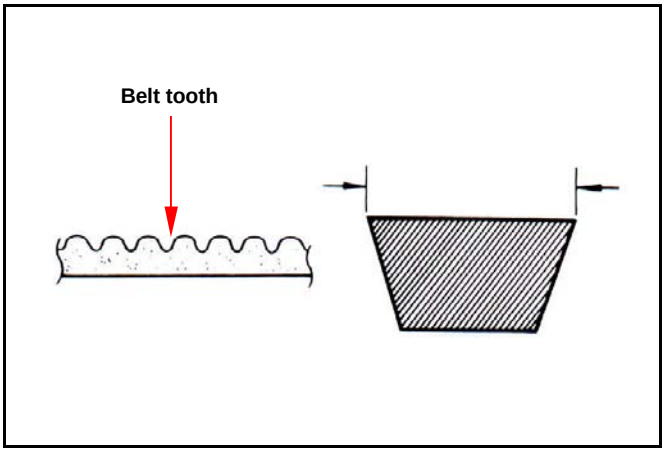
- Using special tools for tightening or loosening the nut.
- Fixed rear wheel or rear brake will damage reduction gear system.

Push the drive belt into belt groove as diagram shown so that the belt can be loosened, and then remove the driven pulley.
Remove driven pulley/clutch. Do not remove drive belt.
Remove the drive belt from the groove of driven pulley.



Inspection

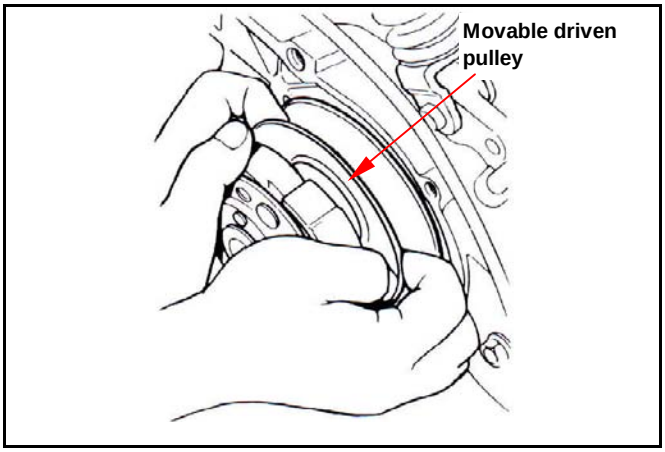
Check the drive belt for crack or wear. Replace it if necessary.
Measure the width of drive belt as diagram shown.
Service Limit: 16.5 mm
Replace the belt if exceeds the service limit.



Caution

- Using the genuine parts for replacement
- The surfaces of drive belt or pulley must be free of grease.
- Clean up all grease or dirt before installation.

Installation

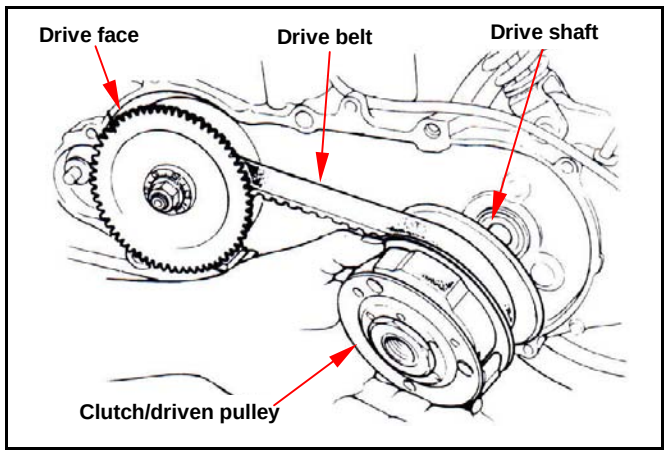


Caution

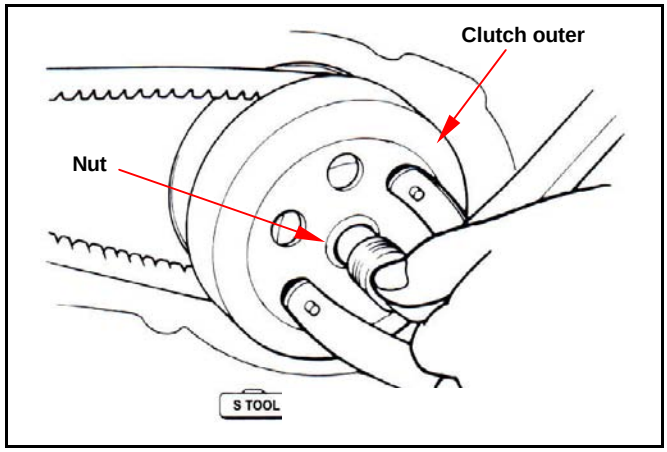
- Pull out driven pulley to avoid it closing.

Install drive belt onto driven pulley.

Install the driven pulley that has installed the belt onto drive shaft.



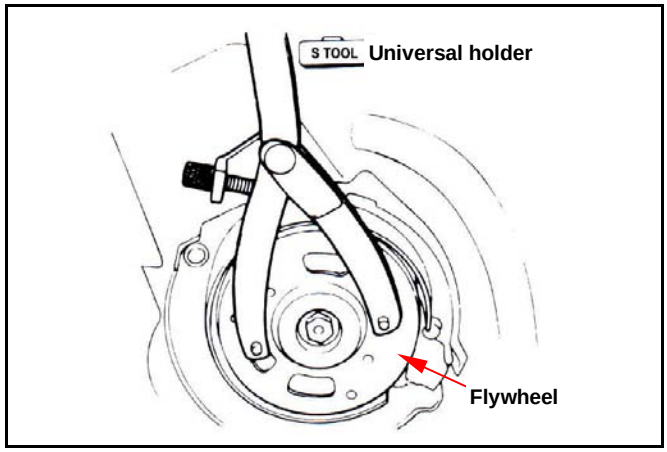
Hold the clutch outer, and then tighten nut to specified torque value.
Special tool:
Universal holder SYM-2210100
Torque value: 3.5~4.5kgf-m



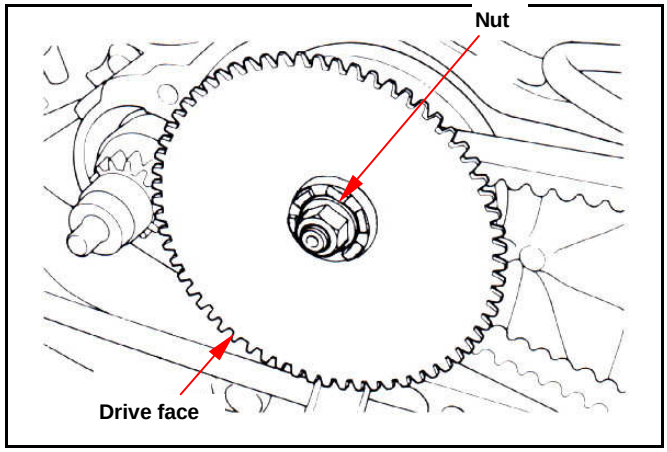
Movable Drive Face

Removal

Remove fan cover and fan.
Remove left crankcase cover.
Hold generator flywheel with universal holder, and then remove drive face nut.
Special tool:
Universal holder SYM-2210100



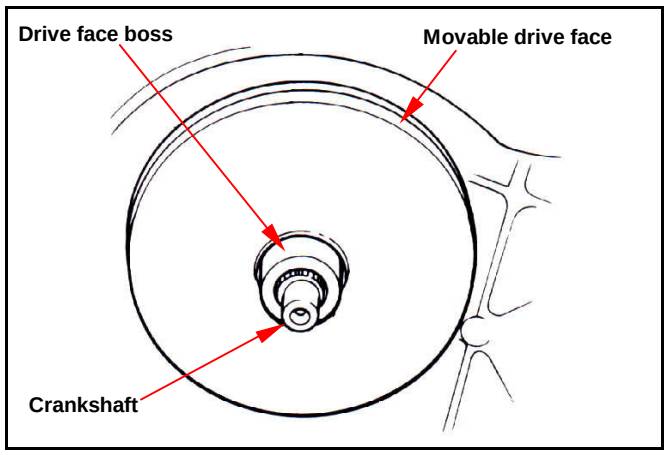
Remove drive face.



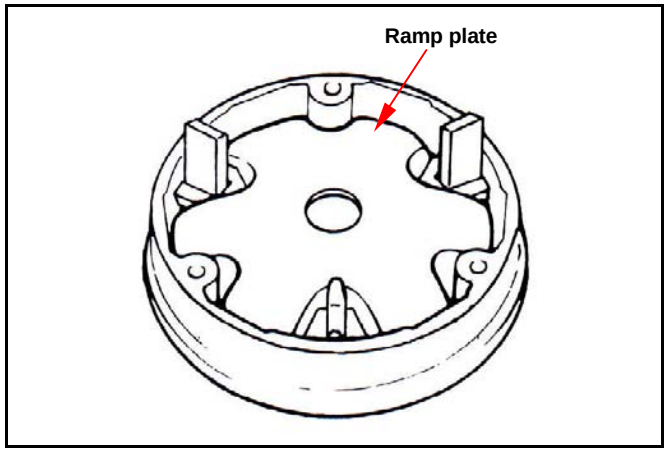
8. "V" Type Belt Drive System/Kick-Starter

Removal

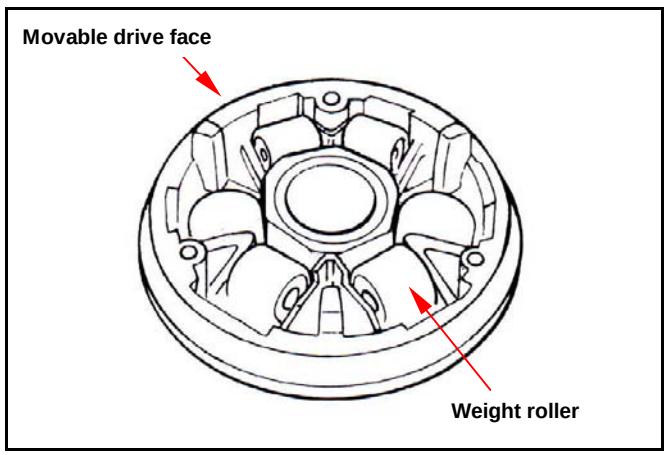
Remove movable drive face set and drive belt from crankshaft.



Remove ramp plate.

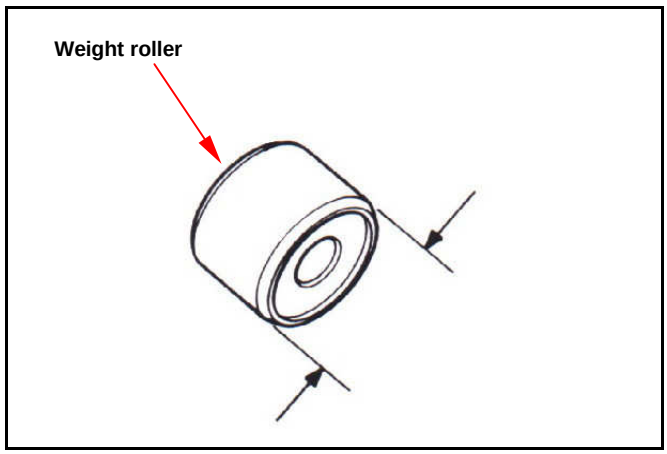


Remove weight rollers from movable face.

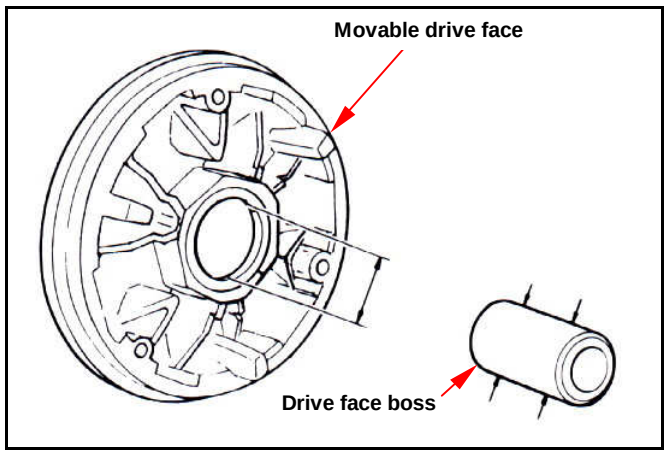


Inspection

The weight roller is to press movable driven face by means of centrifuge force. Thus, if weight rollers are worn out or damage, the centrifuge force will be affected.
Check if rollers are wearing out or damage. Replace it if necessary.
Measure each roller's outer diameter. Replace it if exceed the service limit.
Service limit: 15.40 mm

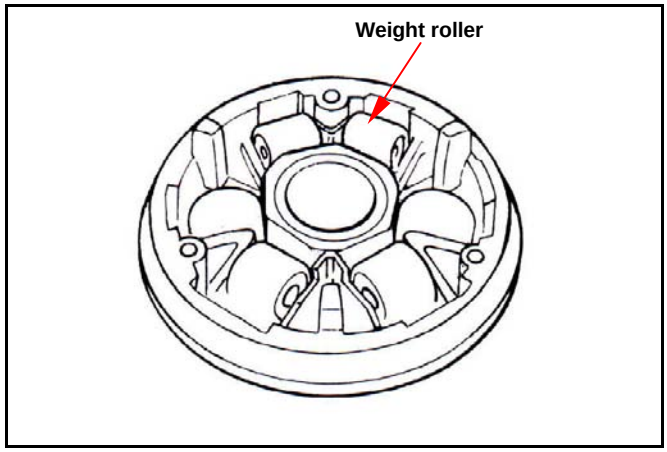


Check if movable drive face boss is worn or damage and replace it if necessary.
Measure the outer diameter of drive face boss, and replace it if it exceed service limit.
Service limit: 19.98 mm
Measure the inner diameter of drive face, and replace it if it exceed service limit.
Service limit: 20.120 mm

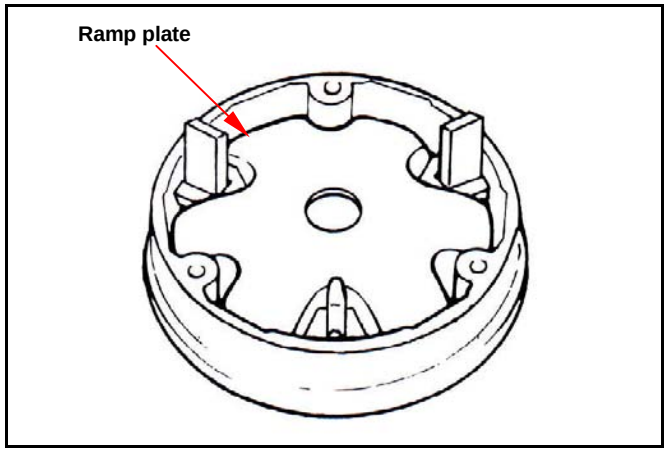


Reassembly / Installation

Install weight rollers.



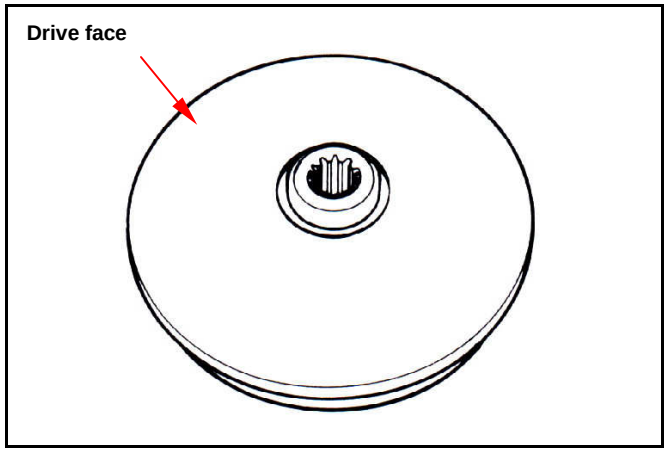
Install ramp plate.



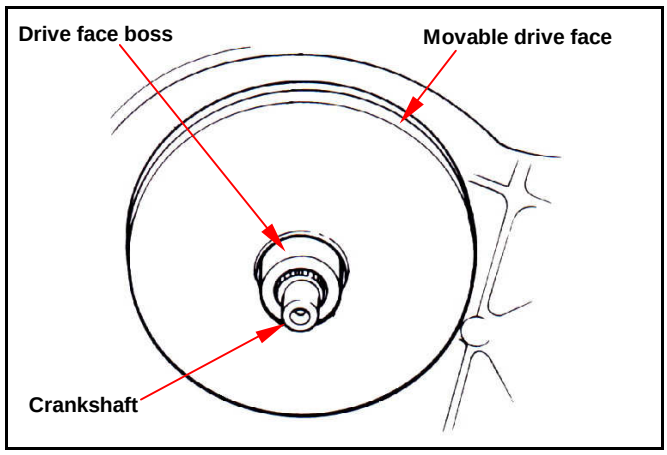
Apply with some grease to inside of movable drive face, and install drive face boss.

⚠ Caution

- The drive face has to be free of grease. Clean it with cleaning solvent.

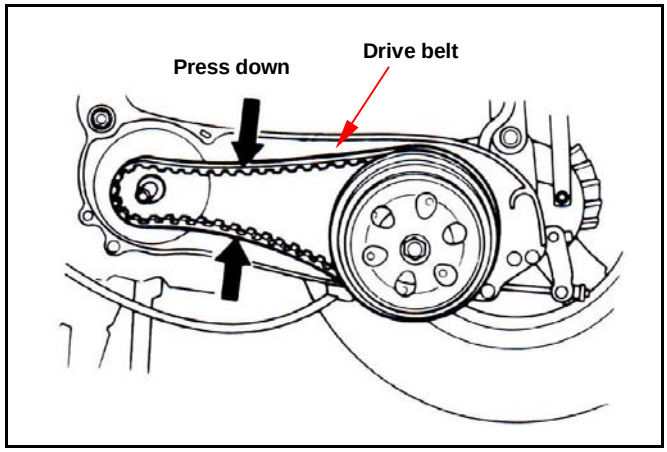


Install movable drive face assembly onto crankshaft.



Drive Face Installation

Press drive belt into pulley groove, and then pull the belt on to crankshaft.

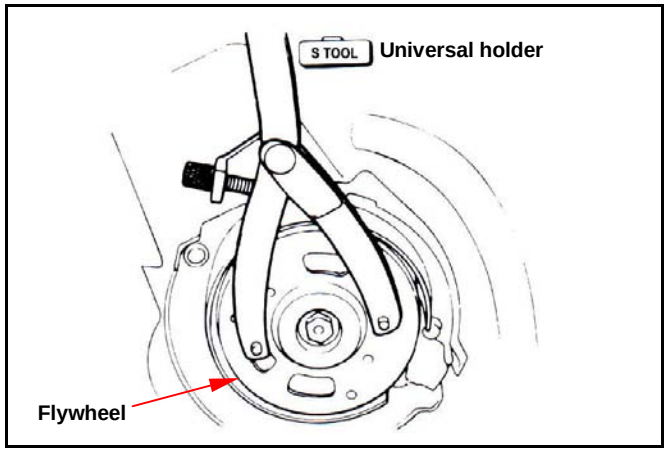


Install drive face, washer and nut.

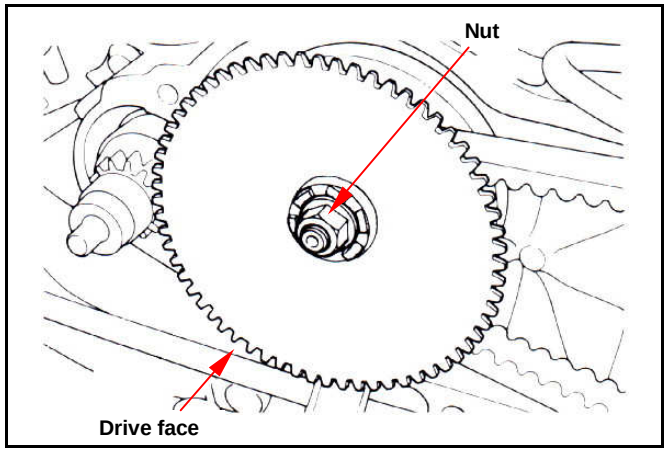
⚠ Caution

- Make sure that two sides of drive face have to be free of grease. Clean it with cleaning solvent.

Hold flywheel with universal holder.



Tighten nut to specified torque.
Torque value: 5.5~6.5kgf-m
Install left crankcase cover.



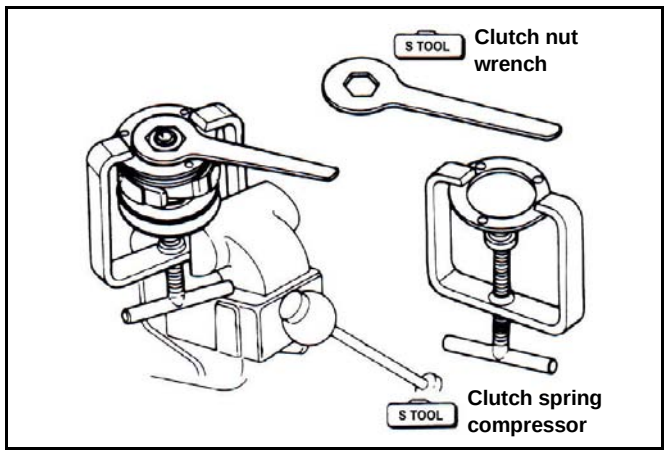
Clutch/Driven Pulley

Disassembly

Remove drive belt and clutch/driven pulley.
Install clutch spring compressor onto the pulley assembly, and operate the compressor to let nut be installed more easily.

Special tool:

Clutch spring compressor	**SYM-2301000**
Clutch nut wrench	**SYM-9020200**

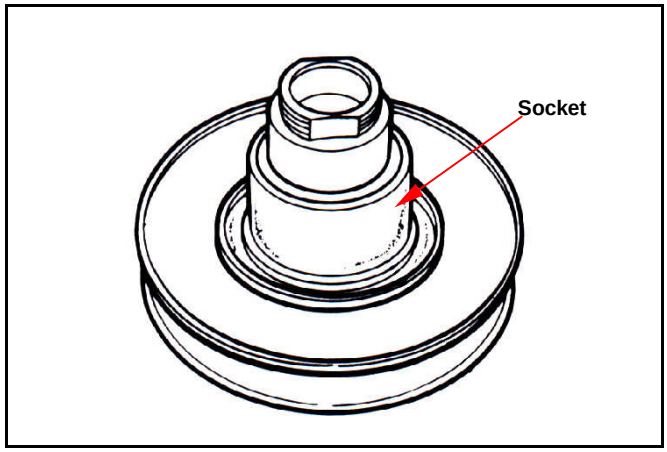


⚠ Caution

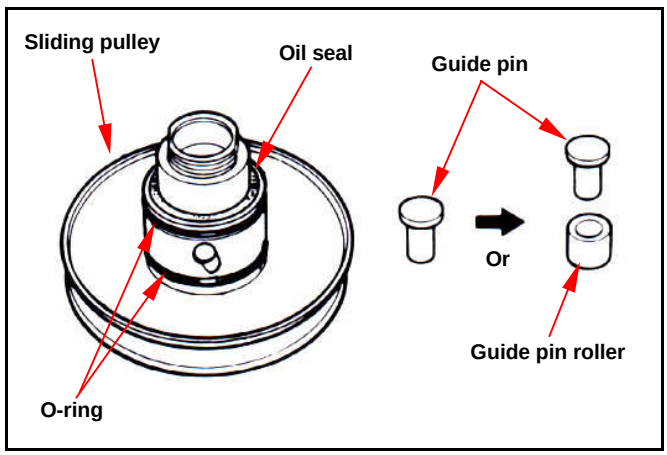
- Do not press the compressor too much.

Hold the clutch spring compressor onto bench vise, and then remove mounting nut with clutch nut wrench.
Release the clutch spring compressor and remove clutch and spring from driven pulley.

Remove socket from sliding pulley.



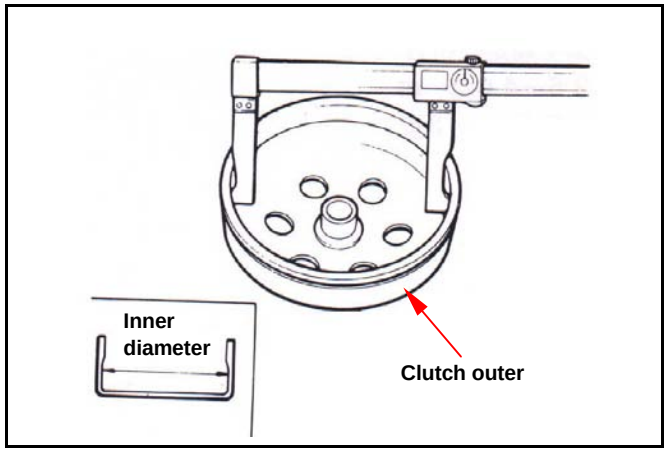
Remove guide pin, guide pin roller, and driven pulley, and then remove O-ring & oil seal seat from sliding pulley.



Inspection

Clutch outer

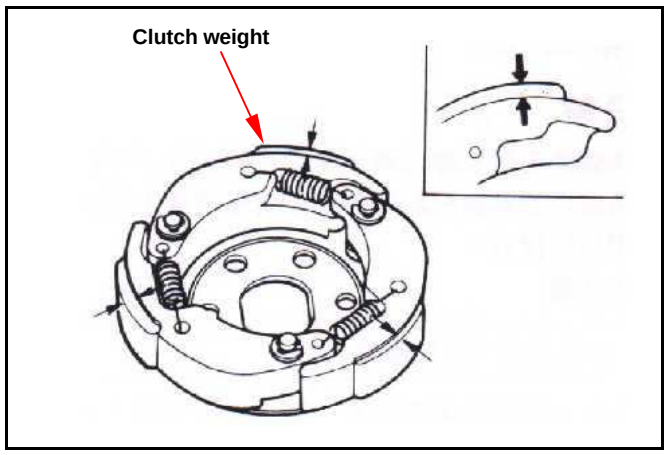
Measure the inner diameter of clutch outer friction face. Replace clutch outer if exceed service limit.
Service limit: 107.5 mm



8. "V" Type Belt Drive System/Kick-Starter

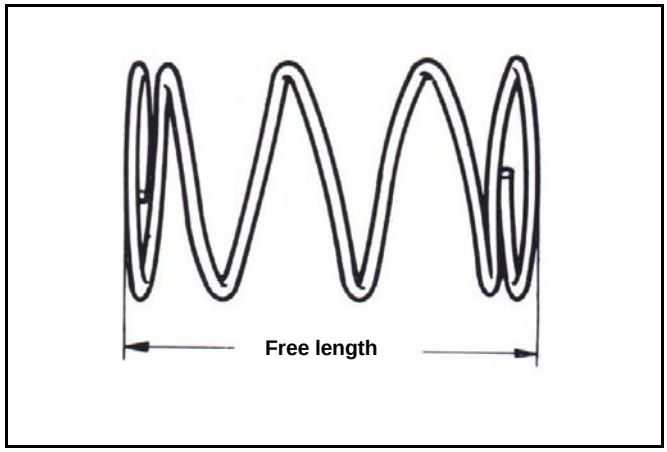
Clutch weight

Measure each clutch weight thickness. Replace it if exceeds service limit.
Service limit: 2.0 mm



Driven pulley spring

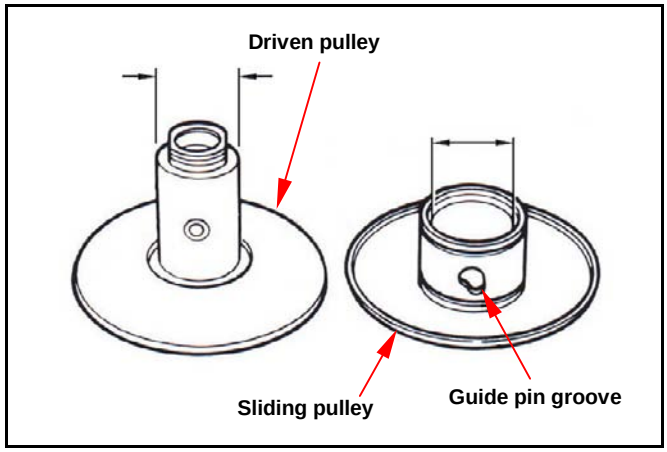
Measure the length of driven pulley spring. Replace it if exceeds service limit.
Service limit: 82.5 mm



Driven pulley

Check following items:
- If both surfaces are damage or wear.
- If guide pin groove is damage or wear.

Replace damaged or worn components.
Measure the outer diameter of driven pulley and the inner diameter of sliding pulley. Replace it if exceeds service limit.
Service limit: Outer diameter 33.94 mm
Inner diameter 34.06 mm

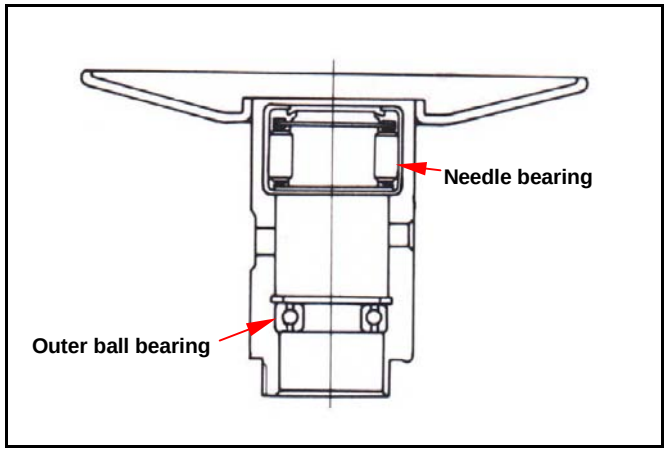


Driven Pulley Bearing Inspection

Check if the inner bearing oil seal is damage. Replace it if necessary.
Check if needle bearing is damage or too big clearance. Replace it if necessary.
Rotate the inside of inner bearing with fingers to check if the bearing rotation is in smooth and silent. Check if the bearing outer parts are closed and fixed. Replace it if necessary.

⚠ Caution

- Some of models are equipped with two ball bearings.



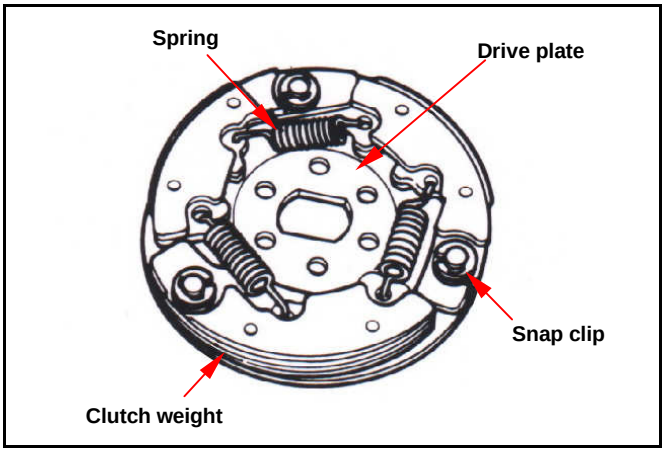
Clutch Block Replacement

Remove clip and washer, and then remove clutch weight and spring from drive plate.

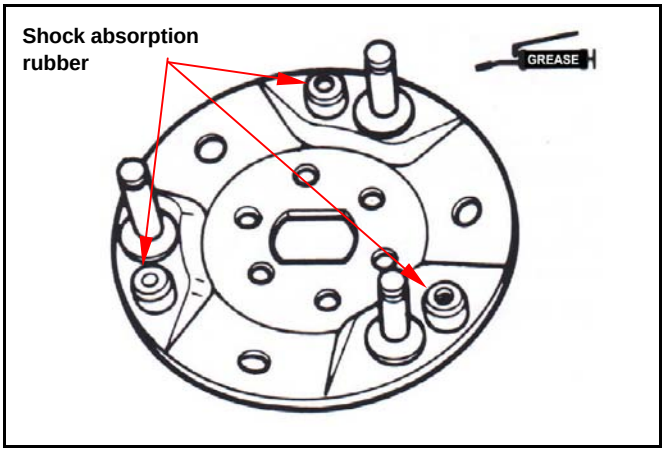
Caution

- Some of models are equipped with one mounting plate instead of 3 snap clips.

Check if spring is damage or insufficient elasticity.



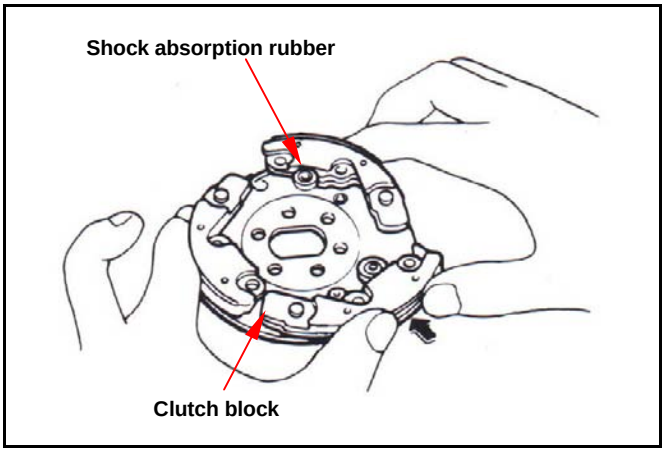
Check if shock absorption rubber is damage or deformation. Replace it if necessary.
Apply with grease onto lock pins.



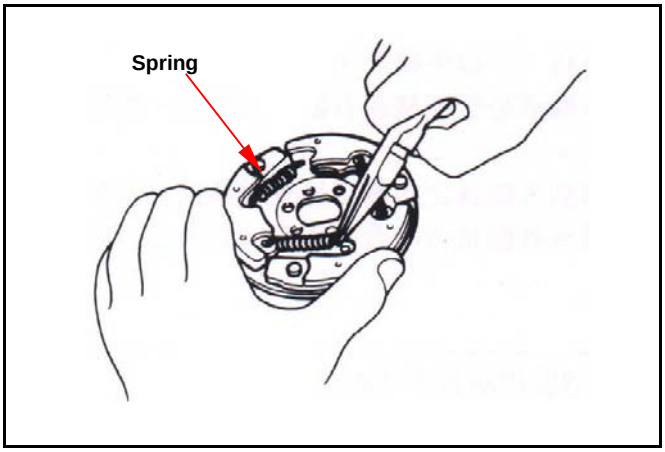
Install new clutch weight onto lock pin and then push to specific location.
Apply with grease onto lock pins. But, the clutch weight should not be greased. If so, replace it.

Caution

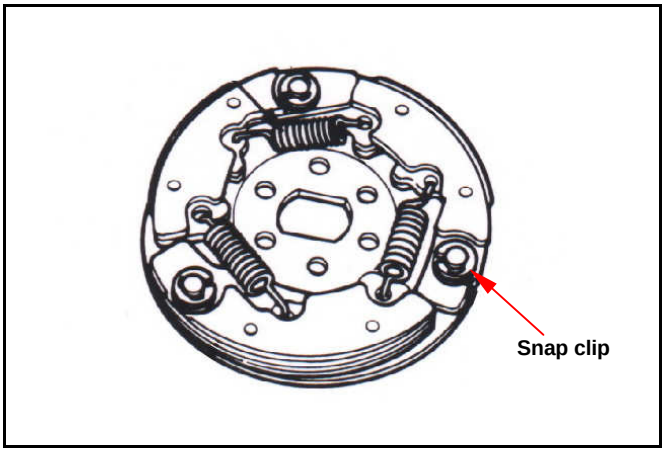
- Grease or lubricant will damage the clutch weight and affect the weight's connection capacity.



Install the spring into groove with pliers.



Install snap clip and mounting plate onto lock pin.

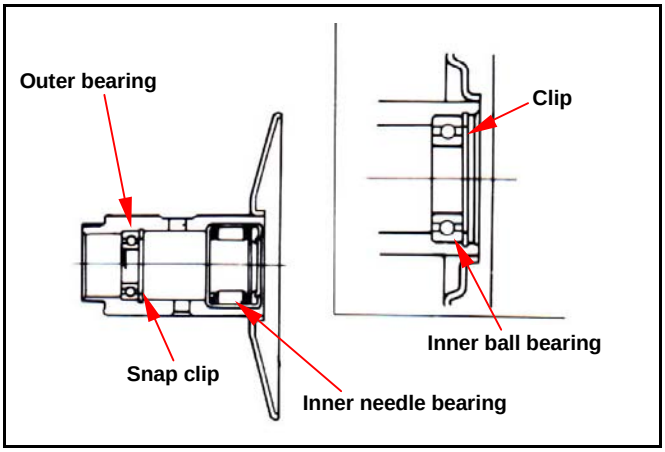


Replacement of Driven Pulley Bearing

Remove inner bearing.

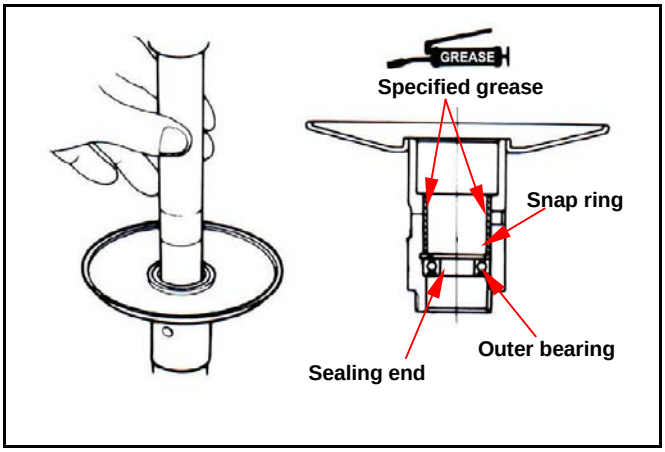
Caution

- If the inner bearing equipped with oil seal on side in the driven pulley, then remove the oil seal firstly.
- If the pulley equipped with ball bearing, it has to remove snap clip and then the bearing.



Remove snap clip and then push bearing forward to other side of inner bearing.

Place new bearing onto proper position and its sealing end should be forwarded to outside. Apply with specified grease.

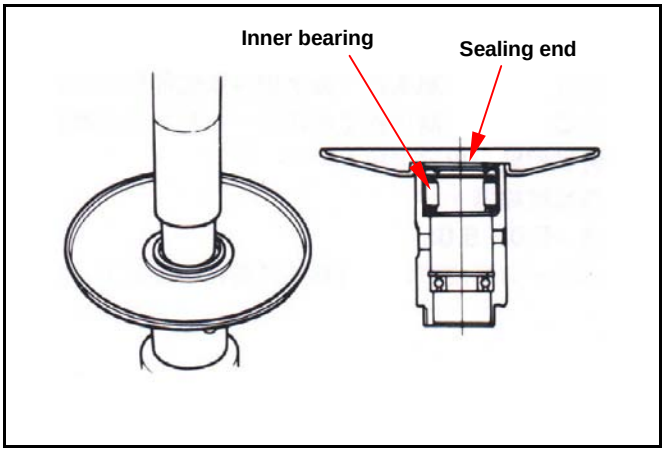


Install new inner bearing.

Caution

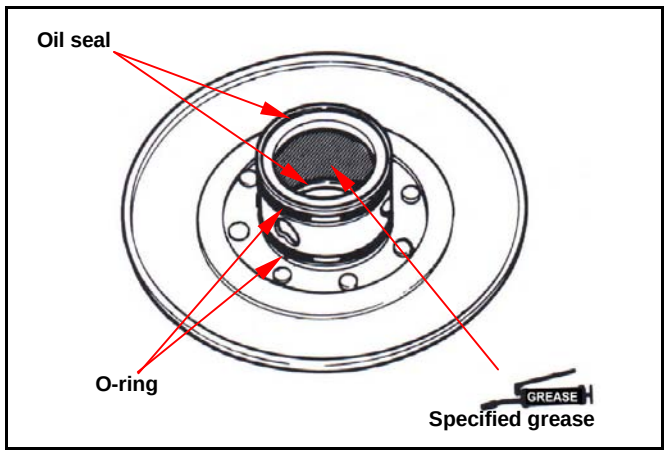
- Its sealing end should be forwarded to outside as bearing installation.
- Install needle bearing with hydraulic presser. Install ball bearing by means of hydraulic presser or driver.

Install snap clip into the groove of drive face. Align oil seal lip with bearing, and then install the new oil seal (if necessary).

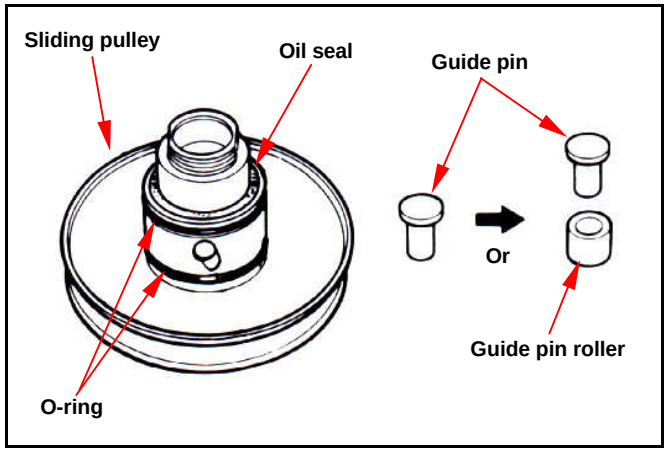


Installation of Clutch/Driven Pulley Assembly

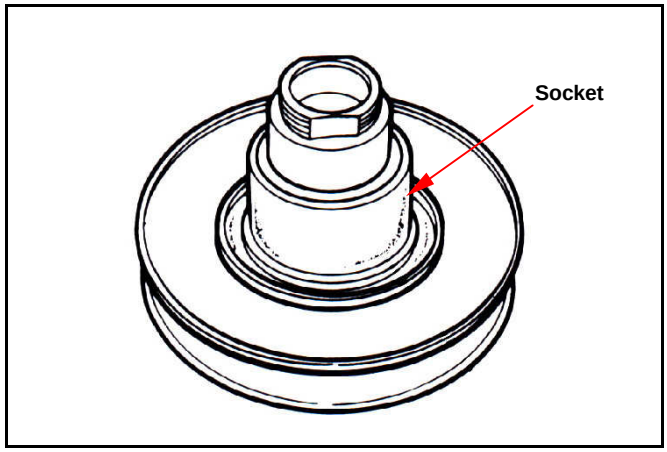
Install new oil seal and O-ring onto sliding pulley. Apply with specified grease to lubricate the inside of sliding pulley.



Install sliding pulley onto driven pulley.
Install guide pin and guide pin roller.



Install socket.



Install driven pulley, spring and clutch into clutch spring compressor, and press down the assembly by turning manual lever until mounting nut that can be installed.
Hold the compressor by bench vise and tighten the mounting nut to specified torque with clutch nut wrench.

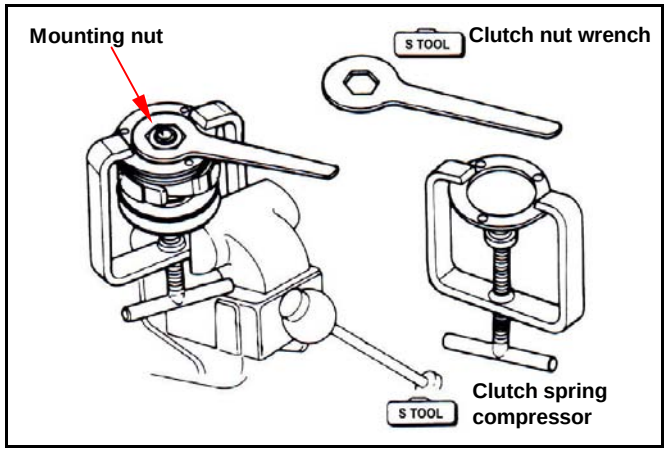
Special tool:

Clutch spring compressor	**SYM-2301000**
Clutch nut wrench	**SYM-9020200**

Remove the clutch spring compressor.

Torque value: 5.0~6.0kgf-m

Install clutch/driven pulley and drive belt onto drive shaft.



9. Final Driving Mechanism

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Troubleshooting ····· 9-2
Disassembly of Final Driving Mechanism ····· 9-3
Inspection of Final Driving Mechanism ····· 9-6
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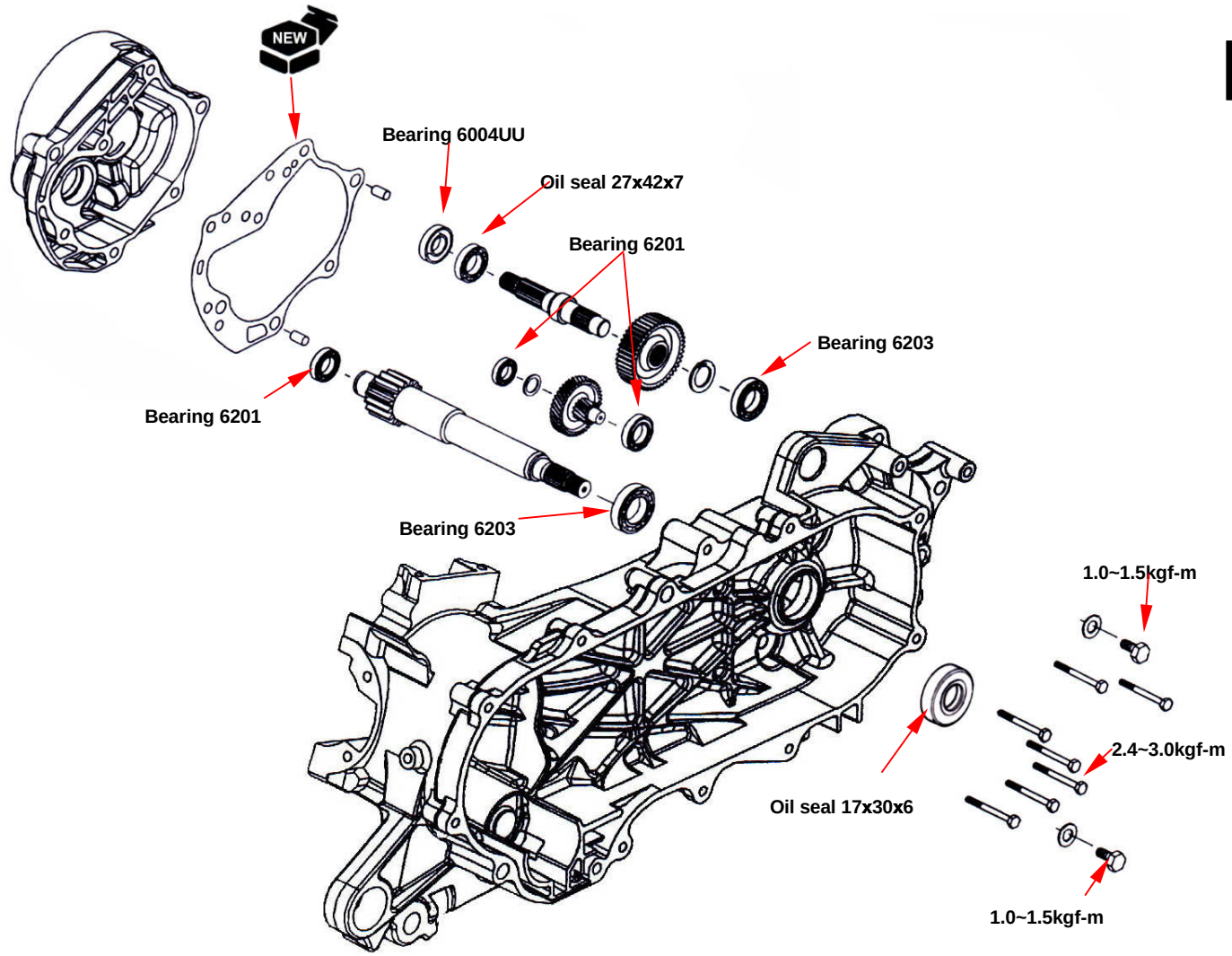


9. Final Driving Mechanism

Maintenance Information

Limited usage of gear oil: gear oil #140
Recommended oil: Bramax serial oil.
Oil quantity: 120 c.c. (110 c.c. as replacement)

Torque Values:

Mission cover bolt	2.4~3.0kgf-m
Mission oil drain bolt	1.0~1.5kgf-m
Mission oil check bolt	1.0~1.5kgf-m

Special tools:

Inner type bearing puller	SYM-6204020
Outer type bearing puller	SYM-6204010
Final shaft oil seal installer	SYM-9125500
Drive shaft oil seal installer	SYM-9120200
Bearing driver 6201	SYM-9610001
Bearing driver 6203/6004UZ	SYM-9620000
R. Crank shaft puller	SYM-1130000-R
L. Crank shaft install bush	SYM-1130010
Extension bush	SYM-1130031 (long)
Extension bush	SYM-1130032 (short)

Troubleshooting

Trouble Diagnosis

Engine can be started but scooter cannot be moved

1. Damaged drive gear
2. Burnt out or seized drive gear

Noise

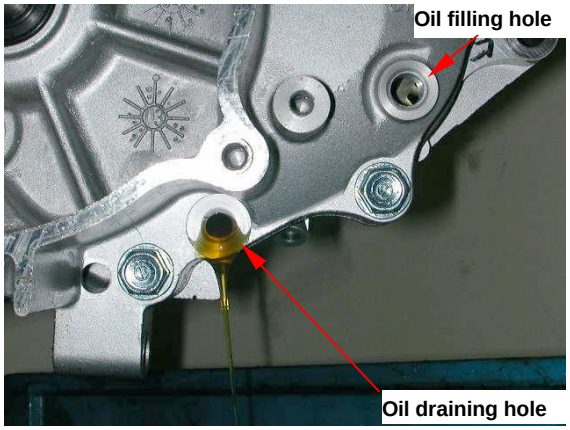
1. Seized, worn or damage gear
2. Worn or loose bearing

Gear oil leaks

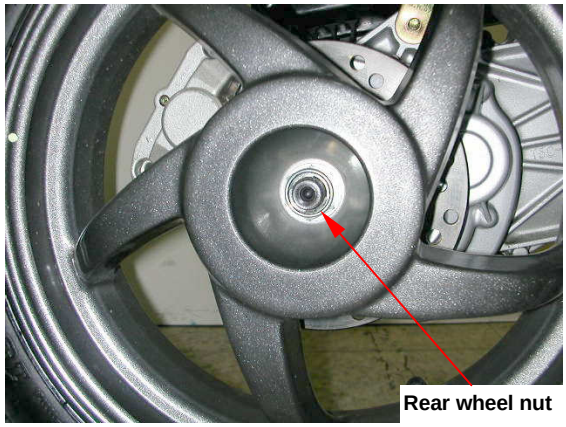
1. Excessive gear oil.
2. Worn or damage oil seal

Disassembly of Final Driving Mechanism

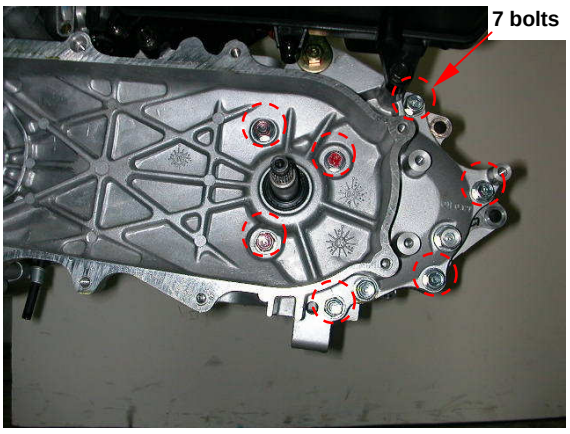
Remove driven pulley
Remove oil drain bolt and filling bolt.
Drain gear oil out from gearbox.



Remove muffler and rear wheel.



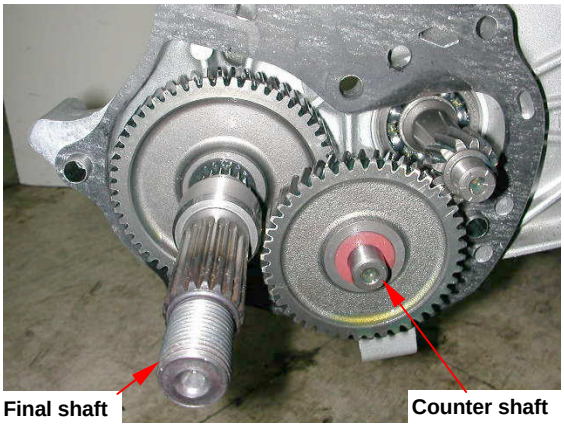
Remove gearbox cover mounting bolts from the clutch side (7 bolts).



Remove the cover from the rear wheel side.

9. Final Driving Mechanism

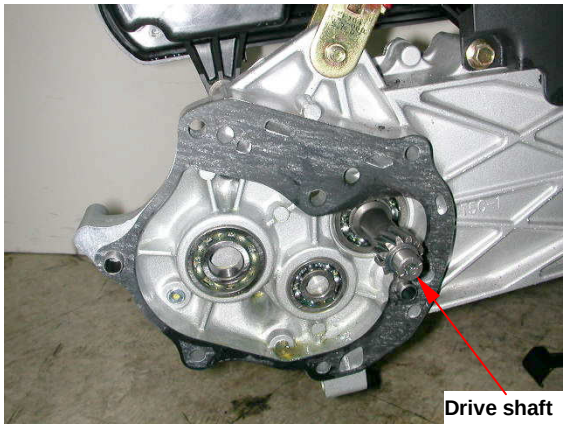
Remove final gear, final shaft and counter gear, counter shaft.



Remove the drive shaft from left crankcase.

⚠ Caution

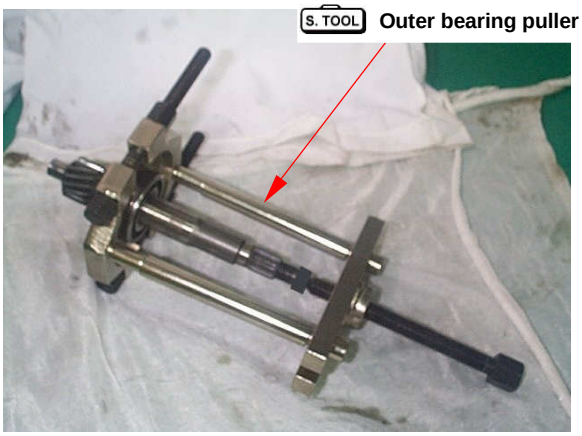
The bearing must be replaced when removing the drive shaft.



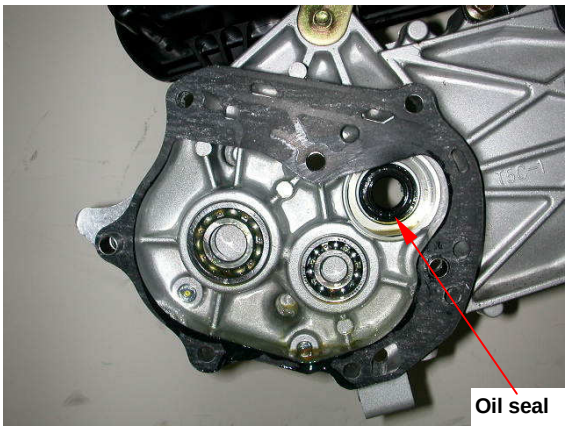
Drive shaft is pulled out with it's bearing, then remove the bearing with bearing puller and shaft protector.

Special tool:

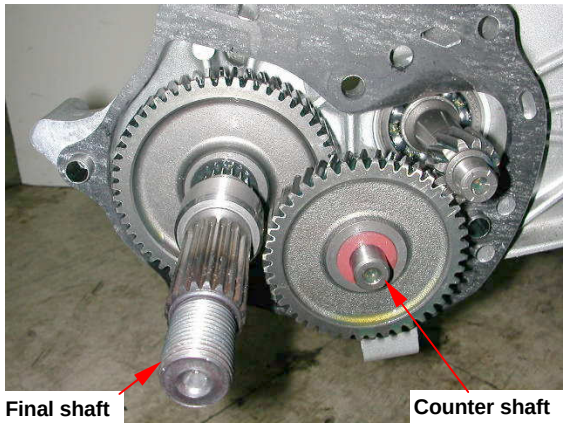
Multi-functional bearing puller or Outer bearing puller	**SYM-6204001**
Shaft protector	**SYM-6204010**



Remove drive shaft oil seal and bearing from left crankcase.



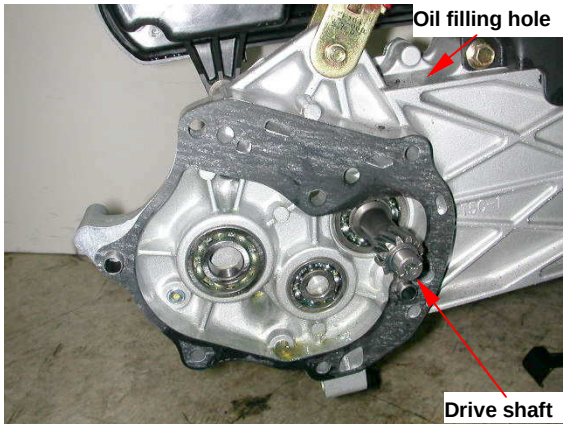
Remove final gear, final shaft and counter gear, counter shaft.



Remove the drive shaft from left crankcase.

⚠ Caution

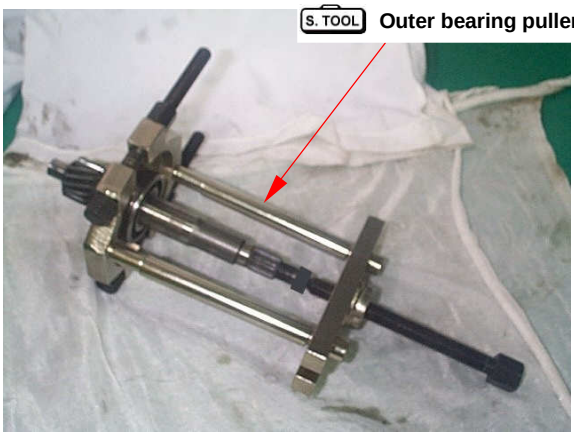
The bearing must be replaced when removing the drive shaft.



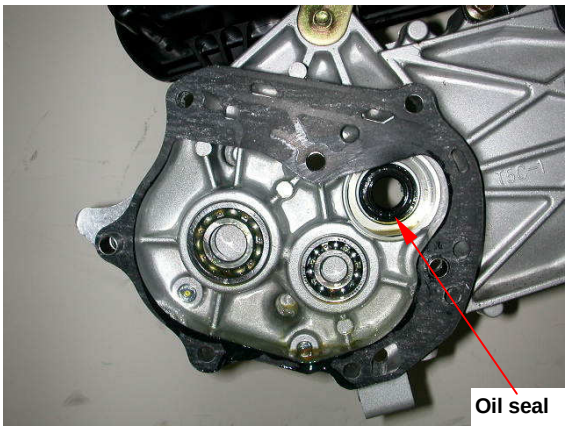
Drive shaft is pulled out with it's bearing, then remove the bearing with bearing puller and shaft protector.

Special tool:

Multi-functional bearing puller or Outer bearing puller	**SYM-6204001**
Shaft protector	**SYM-6204010**

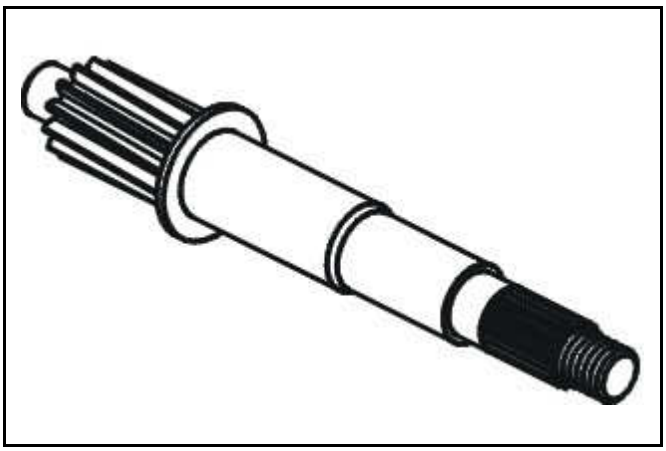


Remove drive shaft oil seal and bearing from left crankcase.



Inspection of Final Driving Mechanism

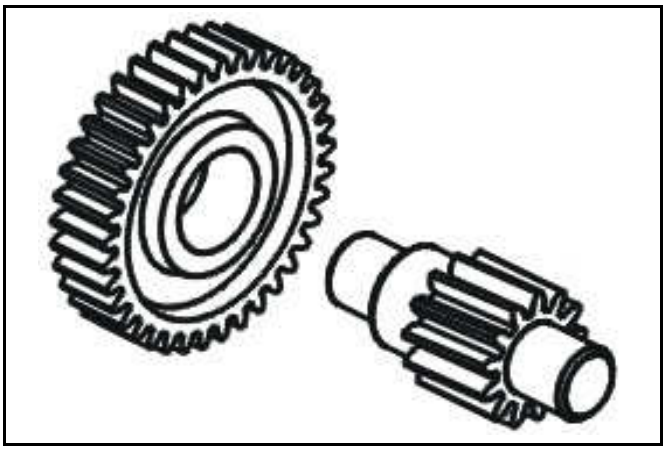
Check if the drive shaft are burn, wear or damage and replace it if necessary.



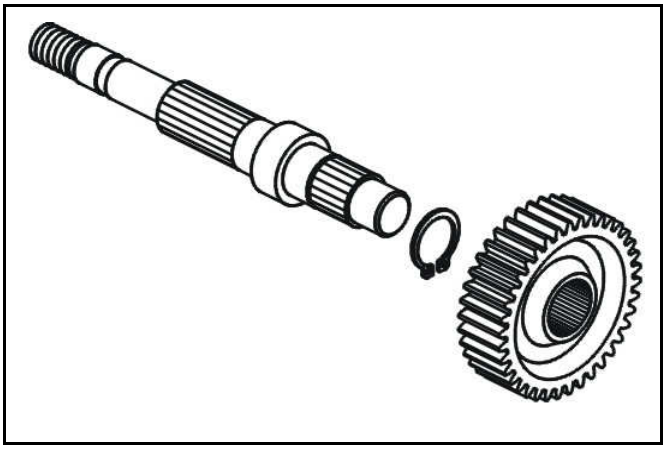
Caution

- If remove the drive shaft from the gear box upper side, then its bearing has to be replaced.

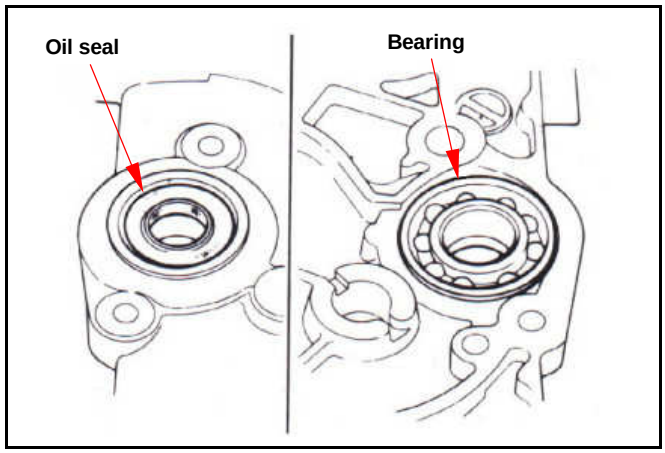
Check if the countershaft is wear or damage and replace it if necessary.



Check if the final shaft and gear are burn, wear or damage and replace it if necessary.



Check bearings on gearbox cover.
Rotate each bearing's inner ring with fingers.
Check if bearings can be turned in smooth and silent, and also check if bearing outer ring is mounted on gear tightly.
If bearing rotation is uneven, noising, or loose bearing mounted, then replace it.
Check oil seal for wear or damage, and replace it if necessary.
Check gearbox bearing as the same way above, and replace it if necessary.



Bearing Replacement

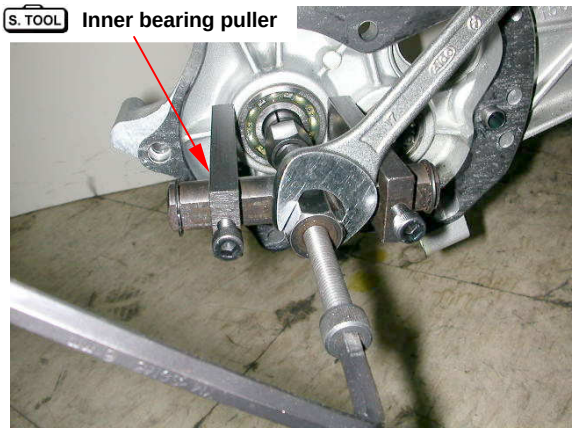
Remove gearbox bearing from left crankcase and gearbox cover using following tools.

Special tool:

Inner bearing puller SYM-6204020 or SYM-6204021

Caution

Never install used bearings. Once bearing removed, it has to be replaced with new one.

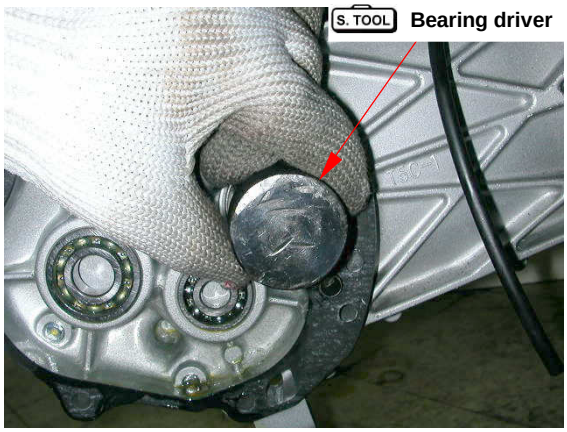


Install new bearings into left crankcase.

Special tool:

Bearing driver 6201 SYM-9610001

Bearing driver 6203/6004UZ SYM-9620000



Install new bearings into gearbox cover.

Special tool:

Bearing driver 6201 SYM-9610001

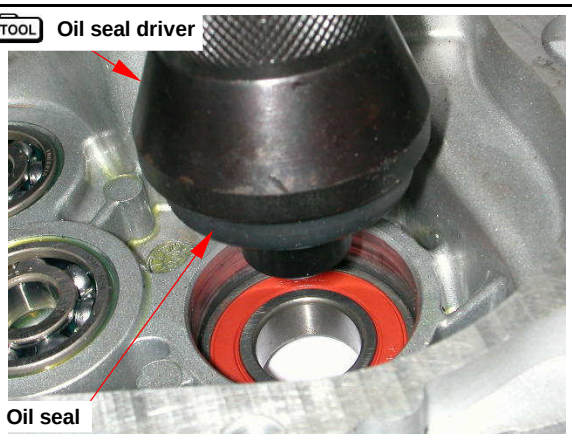
Bearing driver 6203/6004UZ SYM-9620000

Apply with grease onto final shaft oil seal.

Install the oil seal into gearbox cover.

Special tool:

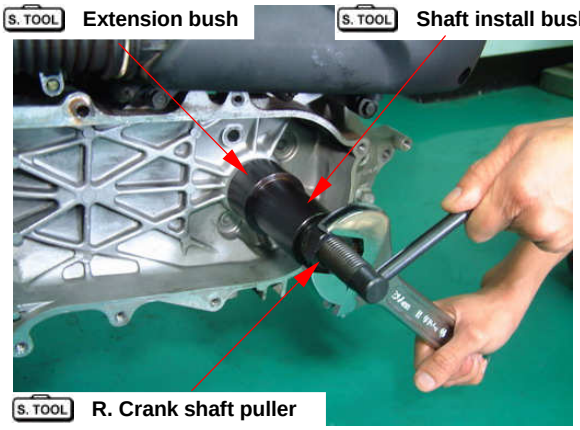
Oil seal driver 27x42x7 SYM-9125500



Re-Assembly of Final Driving Mechanism

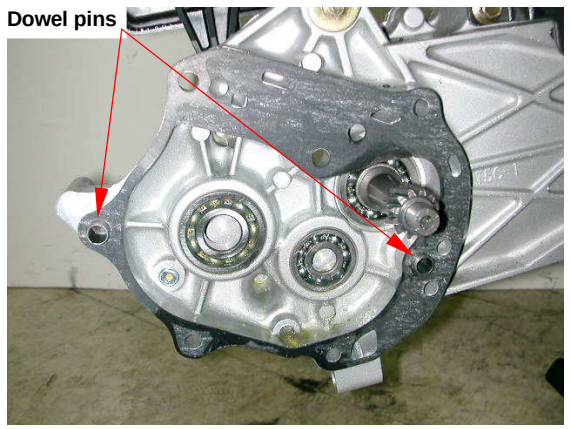
Install drive shaft.
With the special service tools to install drive shaft by through the bearing.
Special tool:

R. Crank shaft puller	**SYM-1130000-R**
L. Crank shaft install bush	**SYM-1130010**
Extension bush	**SYM-1130031 (long)**
Extension bush	**SYM-1130032 (short)**

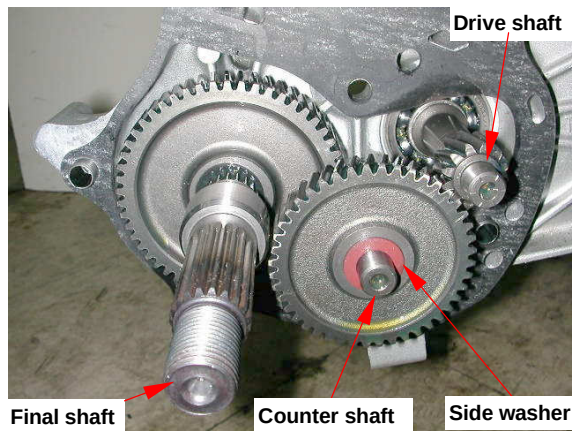


Apply with grease onto drive shaft oil seal.
Install the oil seal to left crankcase.
Special tool:
Drive shaft socket & oil seal driver (17x30x6)
SYM-9120200

Install 2 dowel pins & new gasket.



Install counter shaft, counter shaft side washer and final shaft into the gearbox.
Install the gearbox cover and tighten the bolts (7 bolts).
Torque value: 2.4~3.0kgf-m
Install driven pulley / clutch outer / belt.
Install movable drive face, drive face and left crankcase cover.
Install rear wheel.
Add gear oil.
Gear oil quantity: 120c.c.



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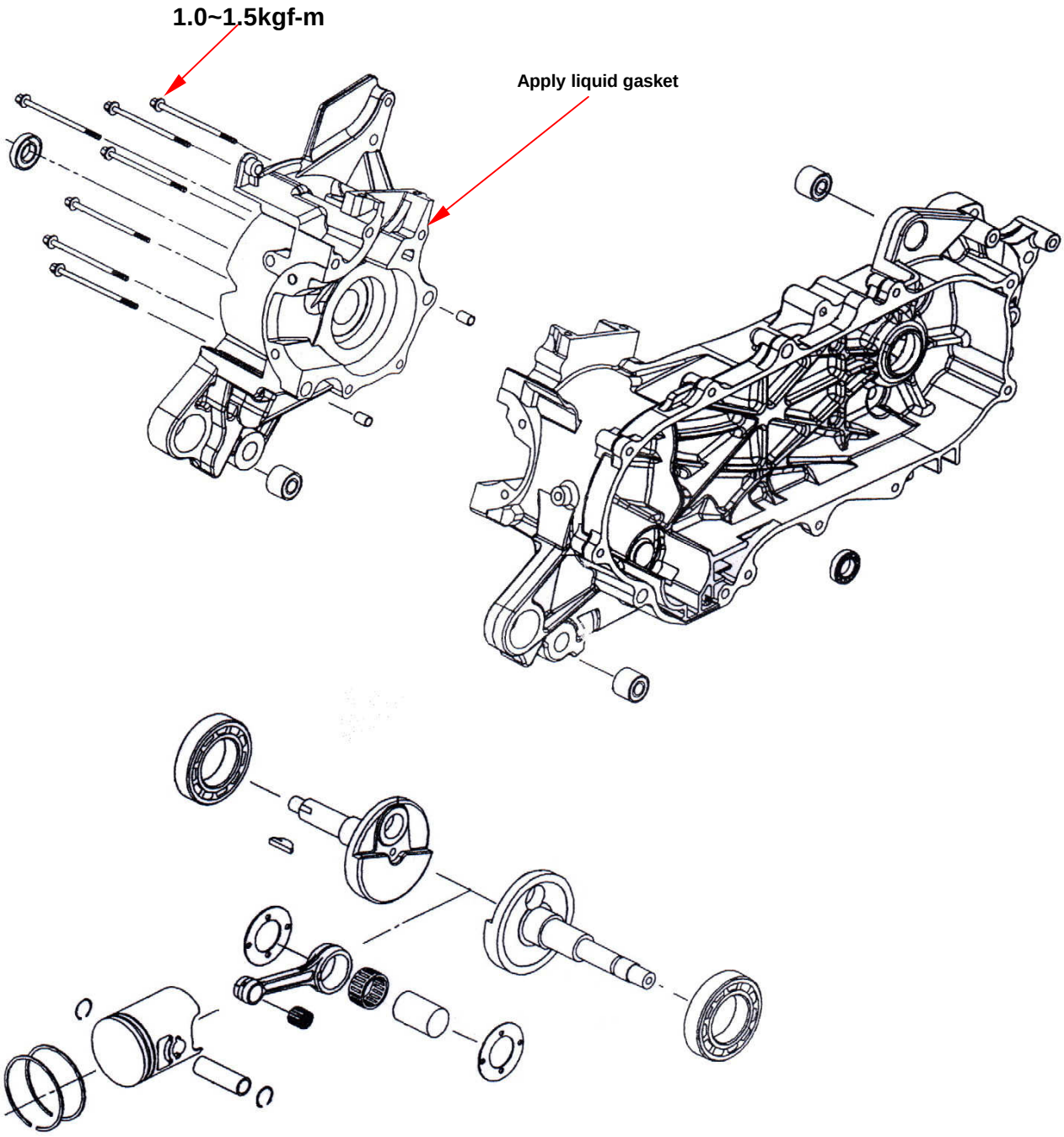
Crankcase Disassembly ····· 10-3	Crankcase Installation ····· 10-5



10. Crankcase/Crankshaft

Maintenance Information

- This chapter concerns disassembly of the crankcase for repair purpose.
- Before disassembling crankcase, except removing engine firstly, following components must be removed too.
- Carburetor (chapter 10)
- Oil pump (chapter 3)
- Reed valve (chapter 10)
- Driving belt (chapter 7)
- Alternator (chapter 6)
- Cylinder head/cylinder/piston (chapter 5)
- Except above components are needed be removed, when disassembling L crankcase, following components must be removed too.
- Final driving mechanism (chapter 8)
- When assembling both crankcase and crankshaft, it has press the inner ring edge of the crankshaft bearing to push the crankshaft into the crankcase hole by using the specified service tools. The old bearing onto the crankshaft has to be removed. Then install a new bearing onto the crankshaft on the crankcase side. Oil seal has to be replaced with new one after assembled the crankcase.

Item	Standard	Limit (mm)
Lateral clearance of the big end of the connecting rod	—	0.60
Radial clearance of the big end of the connecting rod	—	0.04
Crankshaft run-out point A	—	0.10
Crankshaft run-out point B	—	0.10

Special Tools

Crankcase disassemble tool	SYM-1120100-G5
Outer bearing puller	SYM-6204010
R. Crank shaft puller	SYM-1130000-R
R. Crank shaft install bush	SYM-1130020
L. Crank shaft puller	SYM-1130000-L
L. Crank shaft install bush	SYM-1130010
Extension bush	SYM-1130031 (long)
20x31x7 Oil seal driver	SYM-9120200
Bearing driver6204	SYM-9110400

Torque Values:

Crankcase bolt 1.0~1.5kgf-m

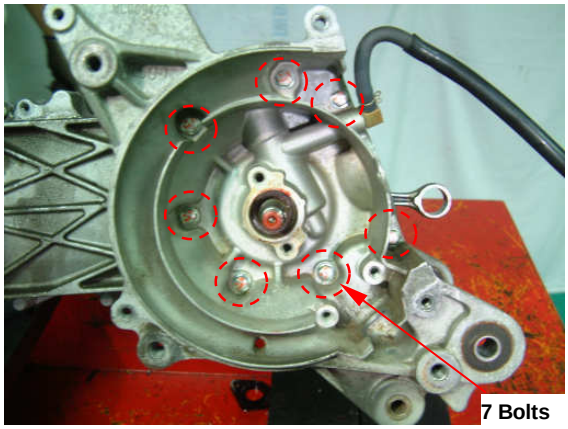
Troubleshooting

Engine noise

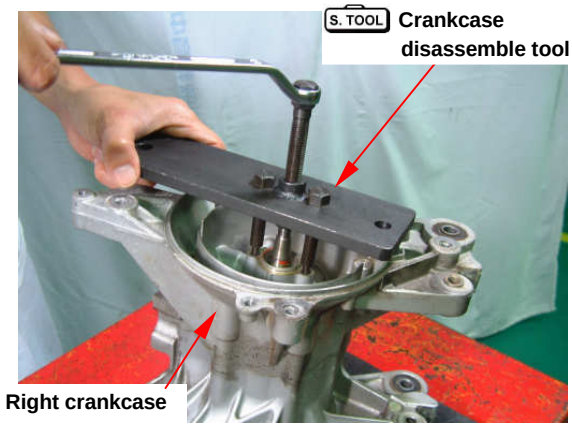
1. Worn bearing of connecting rod bog end
2. Bend connecting rod
3. Worn crankshaft bearing

Crankcase Disassembly

Remove the crankcase bolts.



Install the crankcase puller onto the right crankcase with two (2) bolts, 6mm, as the diagram shown.
Disassemble the right crankcase.
Special Tools:
Crankcase disassemble tool SYM-1120100-G5

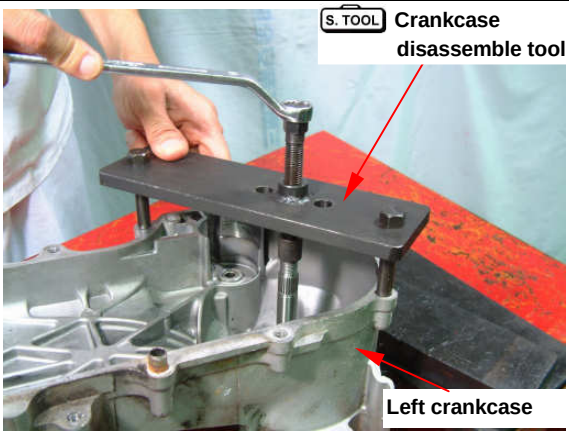


Crankshaft Removal

As the diagram show with 2 special bolts to install the specified service tool onto the left crankcase.
Remove the crankshaft.

⚠ Caution

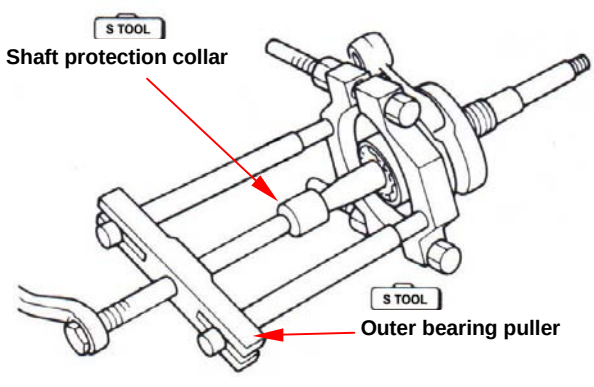
Do not use iron hammer to knock out the crankshaft.



Remove crankshaft bearing with bearing puller.
Remove the right and left side oil seals.

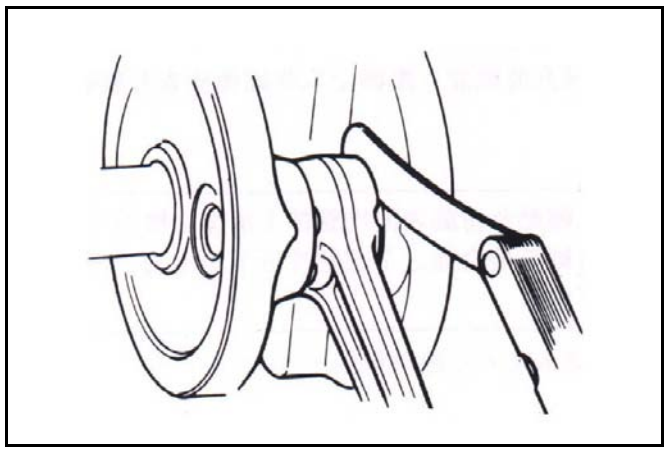
⚠ Caution

Replace the oil seal with new one as removing the crankshaft.

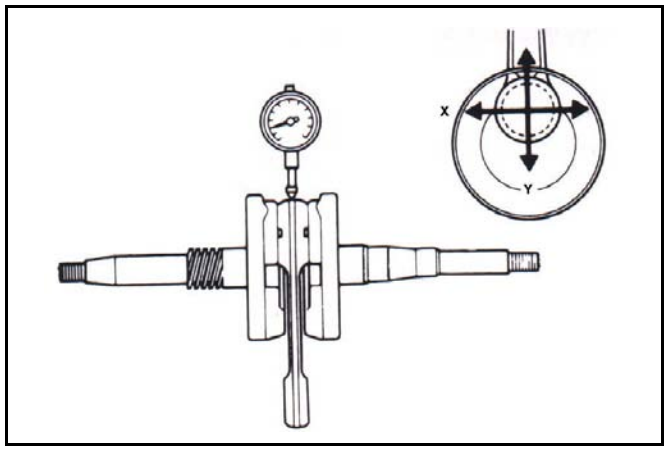


Crankshaft Inspection

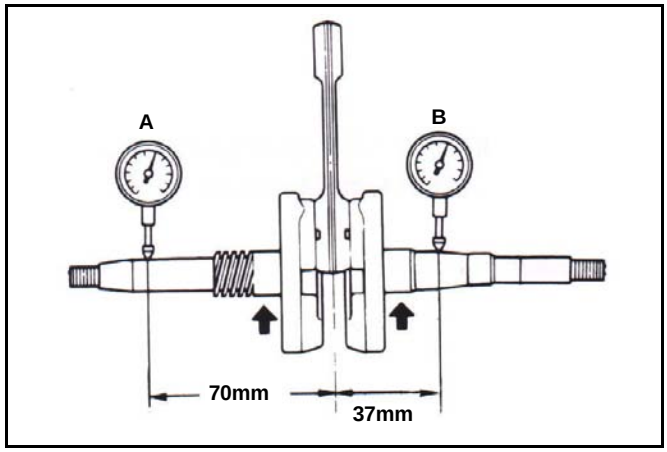
Measure the clearance of connecting rod big end.
Service limit: 0.60 mm



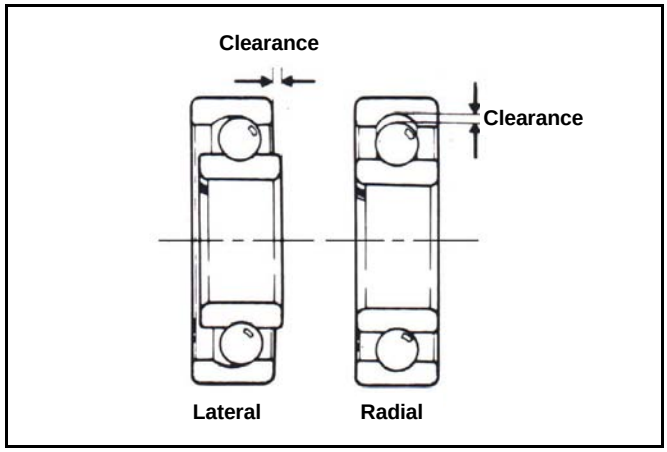
Measure the radial clearance of connecting rod big end at X-Y directions as diagram show.
Service limit: 0.04 mm



Place the crankshaft on a V-block, measure run-out points A and B of the crankshaft with dial gauge.
Service limit: A: 0.10 mm
B: 0.10 mm



Check the crankshaft bearing by means of turning it with hand. If any noise and bigger clearance are detected, replace the bearing with new one.

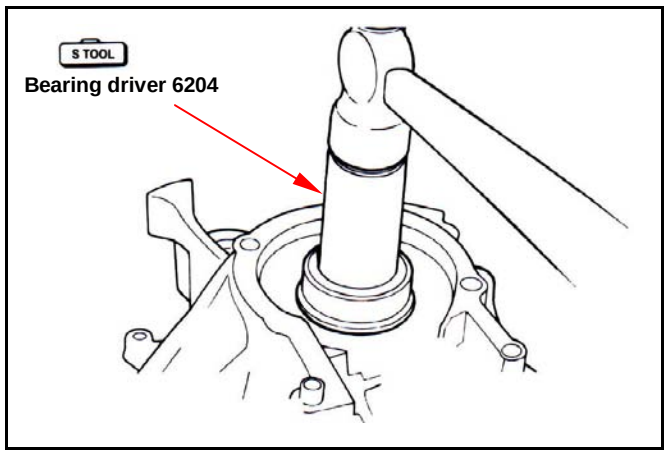


Crankcase Installation

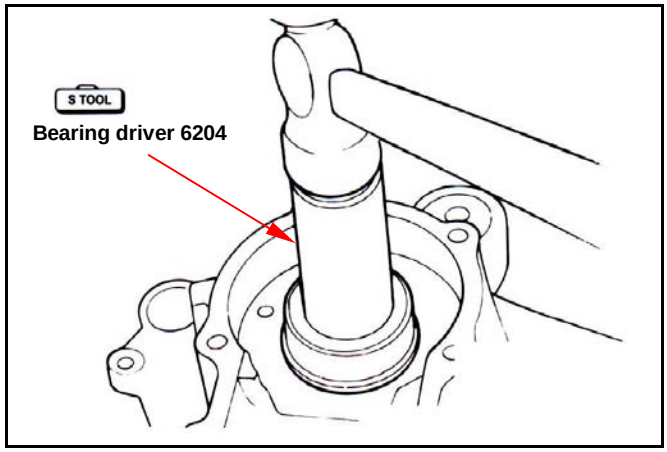
Clean the crankshaft with solvent and blow it with compressed air. Then, check for damage or other foreign materials attached.
Install new bearing into right crankcase.

⚠ Caution

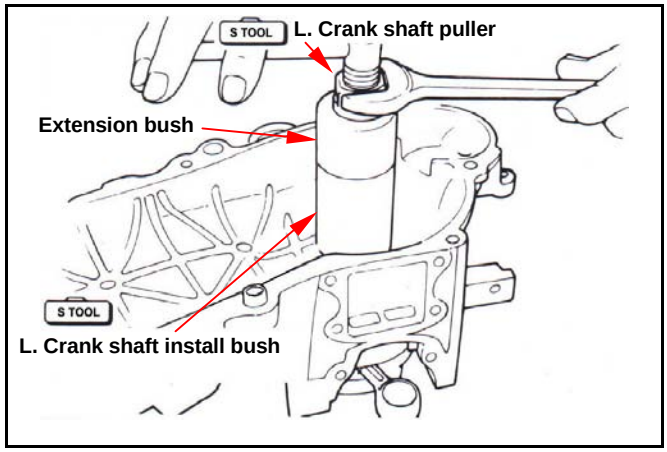
- All rotation and sliding surfaces have to be applied with clean engine oil.
- Remove all gaskets onto the crankcase interfaces and flat it with special tool.



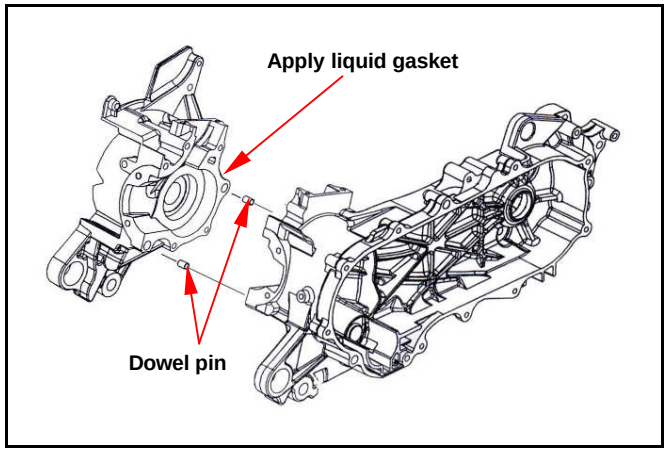
Install new bearing into left crankcase.
Special Tools:
Bearing driver6204 SYM-9110400



Install crankshaft onto the left crankcase.
Install left crankshaft puller and install bush onto crankshaft.
Screw the left crankshaft puller onto crankshaft.
Turn the puller in C.W. direction and then completely screw the puller to bottom.
Lubricate crankshaft bearing and bearing seat with 2-stroke engine oil.
Special Tools:
L. Crank shaft puller SYM-1130000-L
L. Crank shaft install bush SYM-1130010
Extension bush SYM-1130031 (long)



Apply liquid gasket and dowel pin onto the interface of left crankcase.

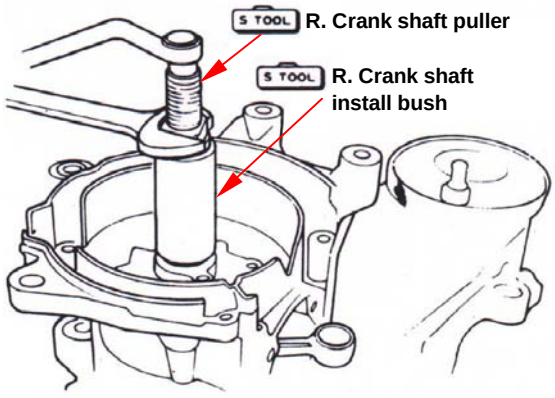


10. Crankcase/Crankshaft

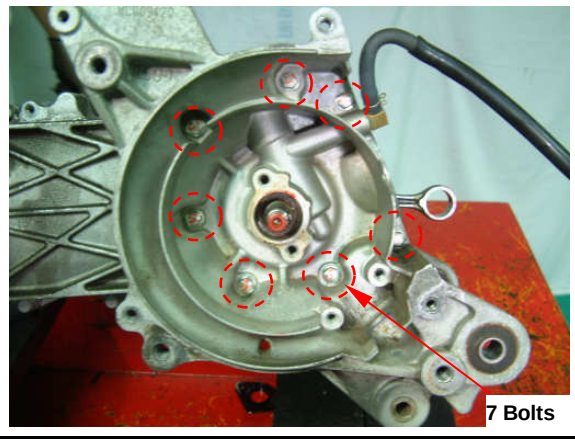
Assemble the right crankcase with assembly tools.
Install right crankcase onto the crankshaft.
Install right crankshaft puller and install bush onto crankshaft.
Screw the right crankshaft puller onto crankshaft.
Turn the puller in C.W. direction and then completely screw the puller to bottom.
Lubricate crankshaft bearing and bearing seat with 2-stroke engine oil.

Special Tools:

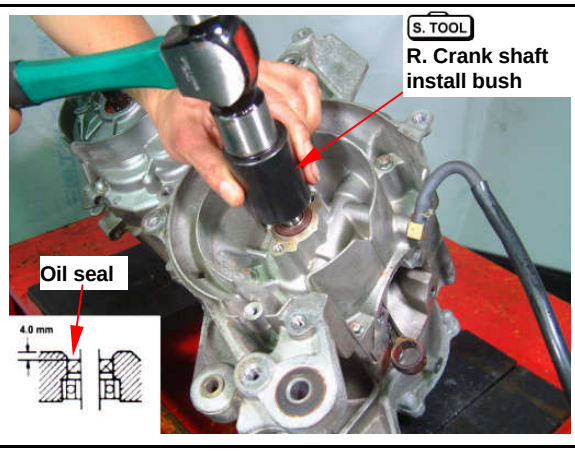
R. Crank shaft puller	**SYM-1130000-R**
R. Crank shaft install bush	**SYM-1130020**



Install the bolts and tighten them.
Torque value: 1.0~1.5kgf-m



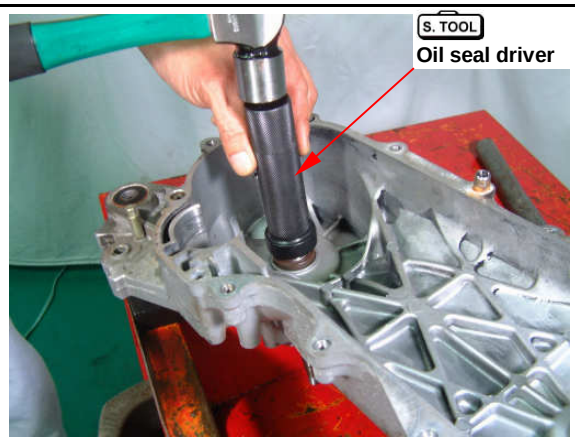
With right crankshaft install bush, install new oil seal into the right crankcase. Its installation depth is 4mm as the diagram shown.



With the specified tool to install a new oil seal onto the left crankcase to the depth of 1 mm as the diagram shown.

⚠ Caution

Make sure that the crankshaft can be rotated freely after tightening the bolts.



Install the following components:
~ Final driving mechanism (chapter 9)
~ Alternator (chapter 7)
~ Piston/cylinder/cylinder head (chapter 6)
~ Oil pump (chapter 3)
~ Reed valve and carburetor (chapter 4)
~ Engine remove (chapter 5)

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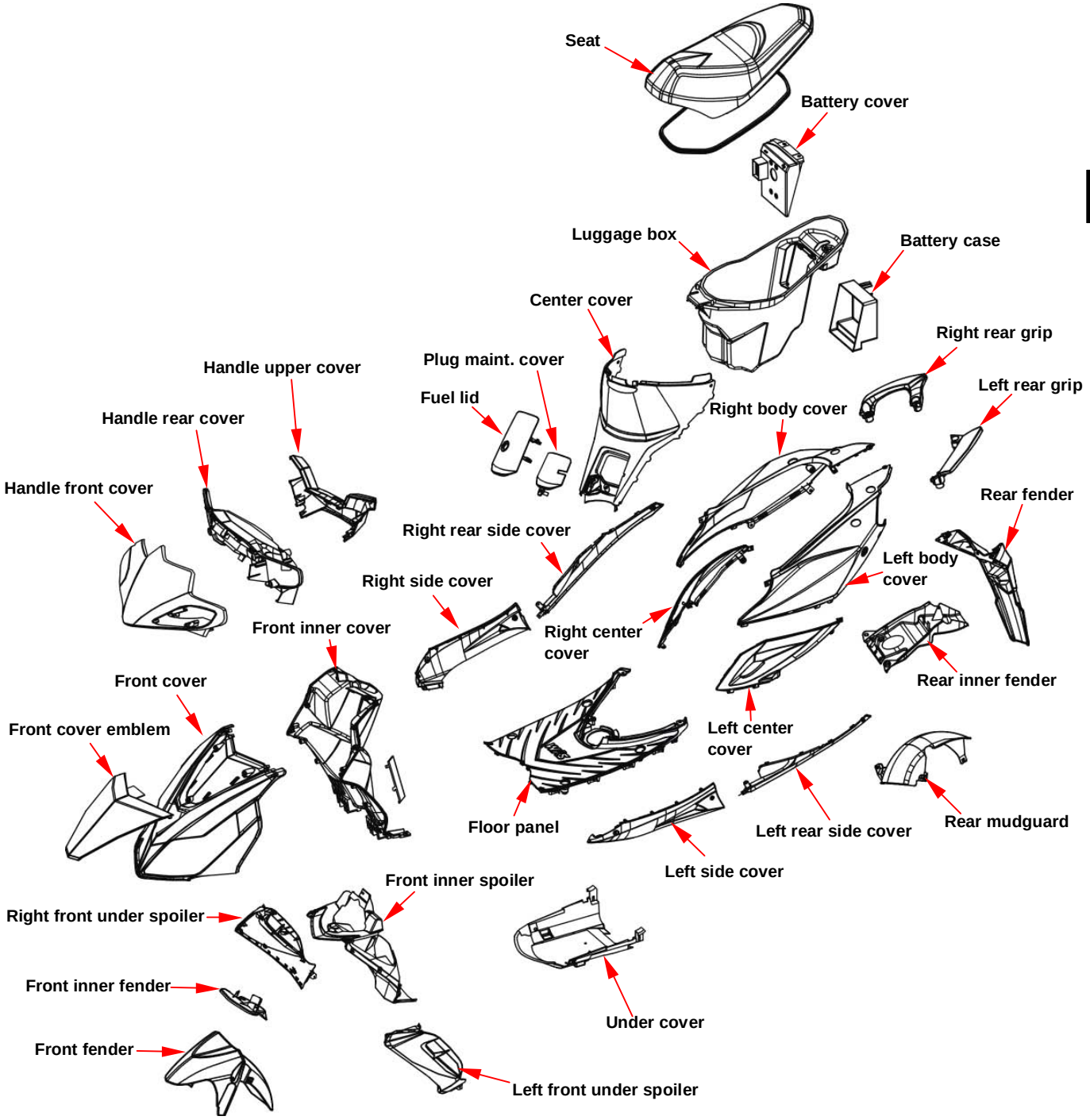
Maintenance Information ····· 11-2	Floor Panel ····· 11-10
Steering Handle Cover ····· 11-3	Front Inner Box ····· 1-11
Front Cover ····· 11-5	Front Fender ····· 11-12
Luggage Box ····· 11-6	Rear Fender ····· 11-12
Side Covers ····· 11-7	Rear Inner Fender ····· 11-
Center Cover ····· 11-8	Rear Mudguard ····· 11
Body Cover ····· 11-8	Under Cover ····· 11-14

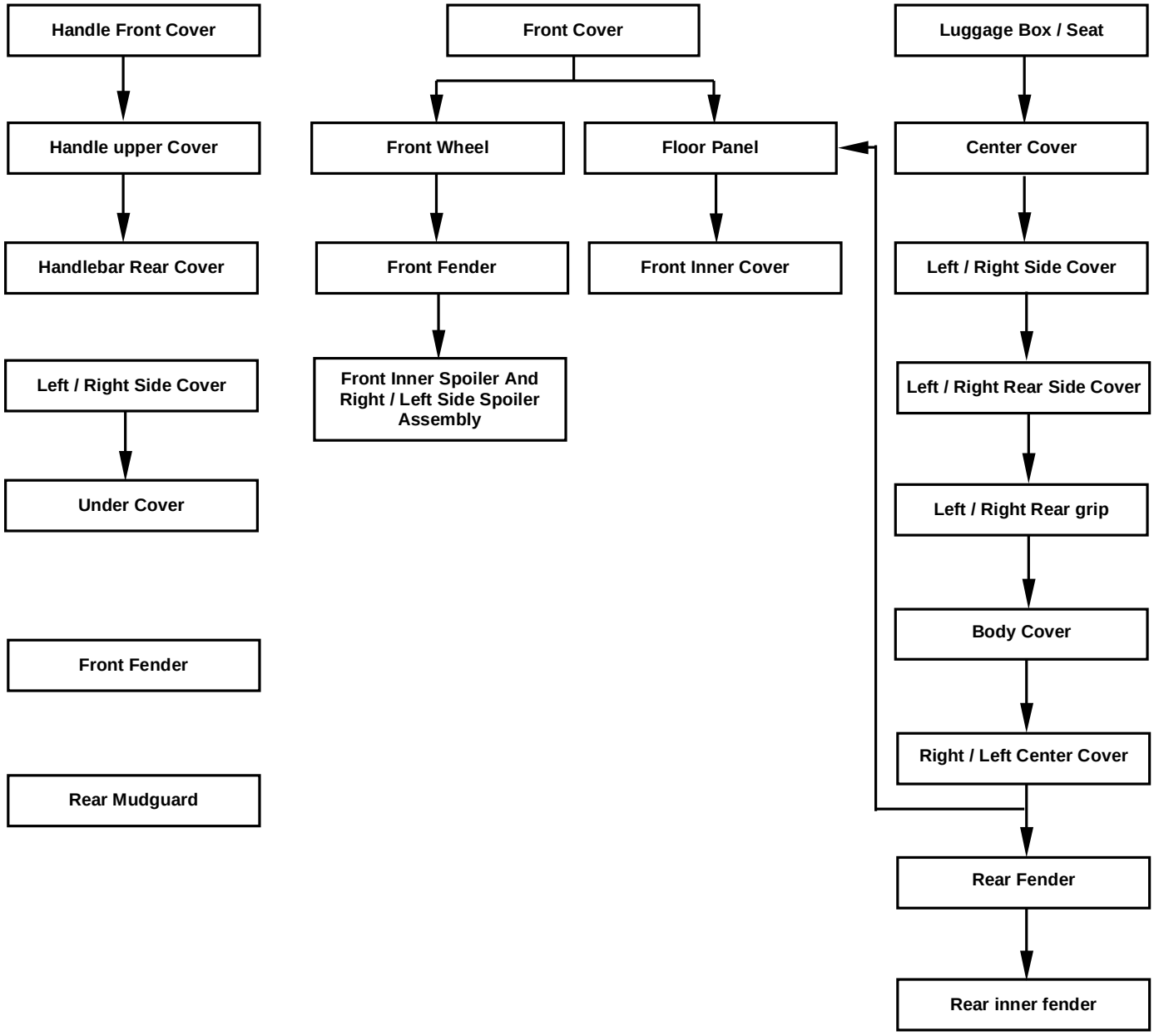
Body Overview



11. Body Cover

Maintenance Information

Body covers disassemble sequence:



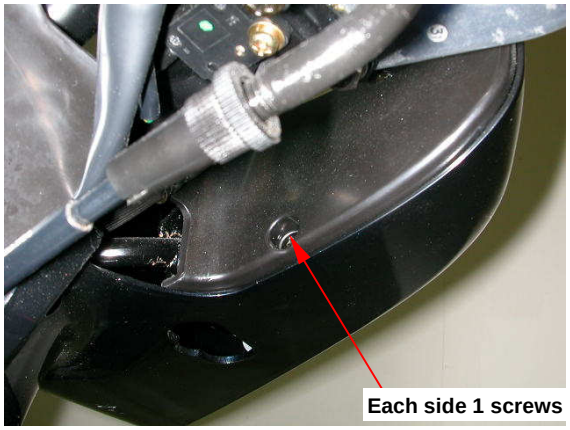
- Be careful not to damage various covers in disassembly or re-assembly operation.
- Never injure hooks molded on the body covers in disassembly or re-assembly operation.
- Align the buckles on the guards with slot on the covers.
- Make sure that each hook is properly installed during the assembly.
- Never compact forcefully or hammer the guard and the covers during assembly.

Steering Handle Cover

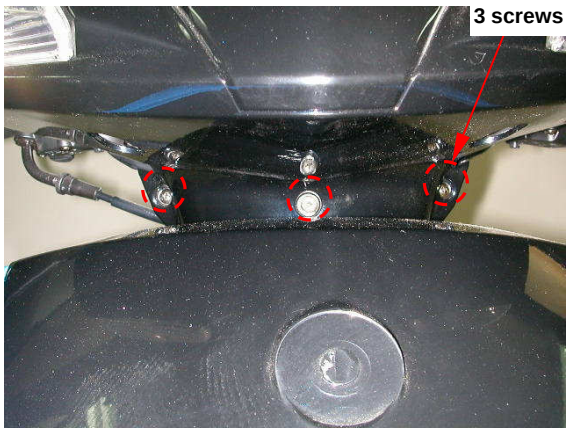
Removal

Remove 4 screws from the handle rear cover upper.

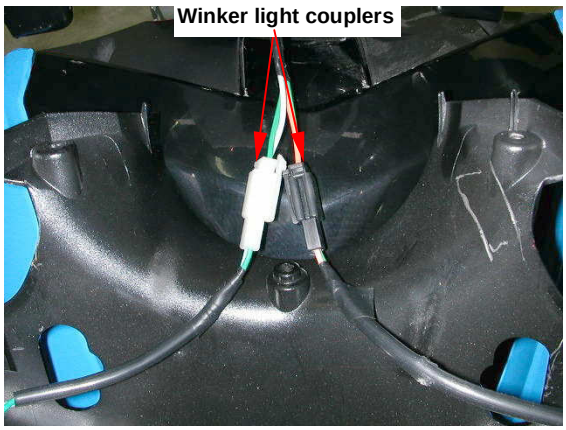
Remove 2 screws from the handle rear cover under.



Remove 3 screws from the handle front cover under.

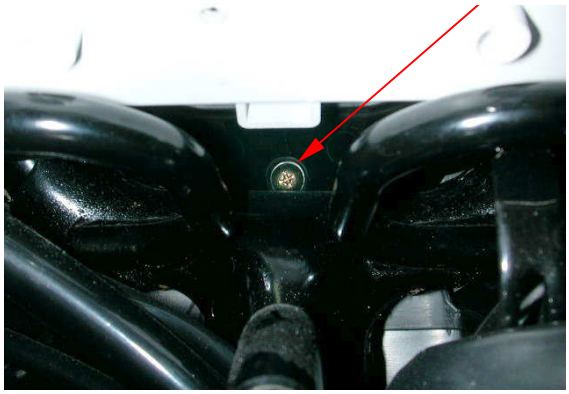


Remove front winker light electric cord couplers.
Remove handle front cover.

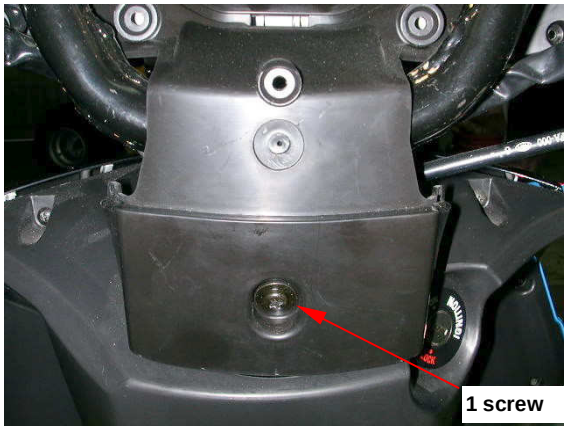


11. Body Cover

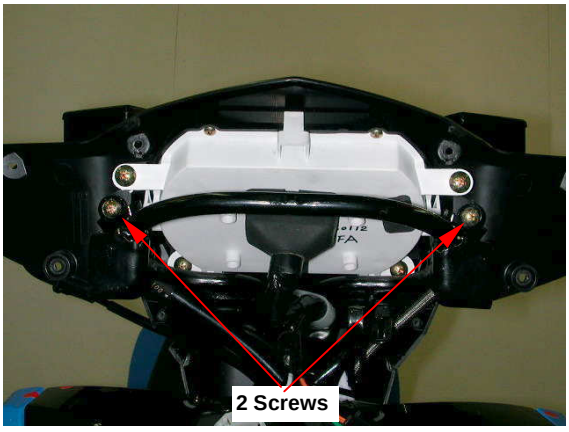
Remove 1 screw from the handle rear cover inner.
Remove handle upper cover.



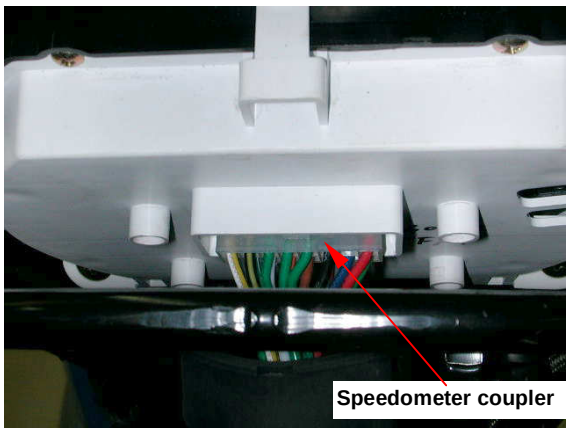
Remove 1 screw from rear by handle rear cover.



Remove 2 inner screws.
Disconnect each switch connectors.



Remove speedometer electric cord coupler.
Remove handle rear cover.



Installation

Install in reverse order of removal procedures.

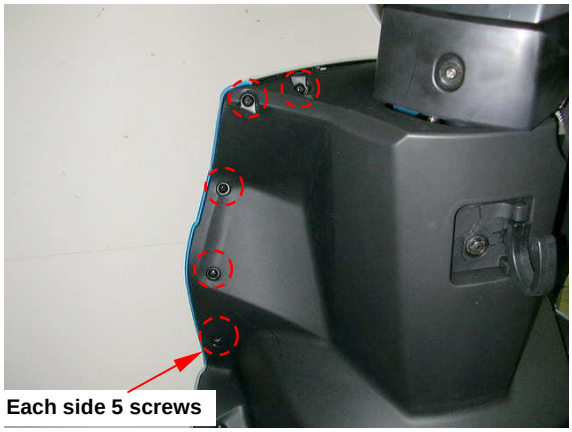
⚠ Caution

Push the front connection part of rear handle cover at first when removing front cover so that the buckles are out of the cover. Never push it forcefully to cause buckles broken or cover damaged.

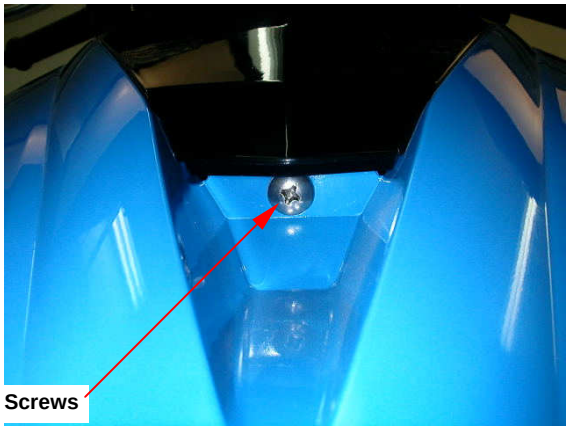
Front Cover

Removal

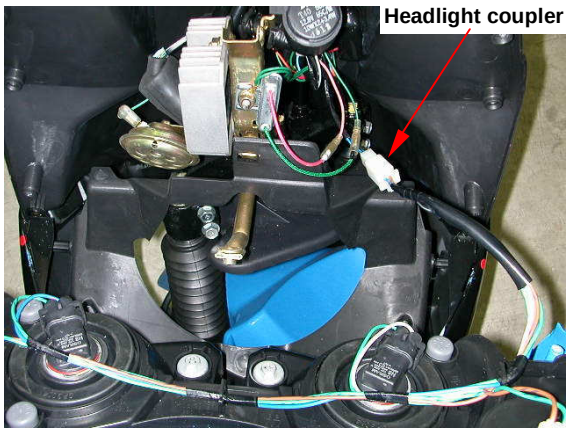
Remove 10 screws from the front inner box and front cover.



Remove 1 screw from the front cover.



Remove electric cord coupler from the headlight.
Remove the front cover.



Installation

Install in reverse order of removal procedures.

Luggage Box

Removal

Lift up seat cushion.
Remove oil tank cap and oil guide rubber.

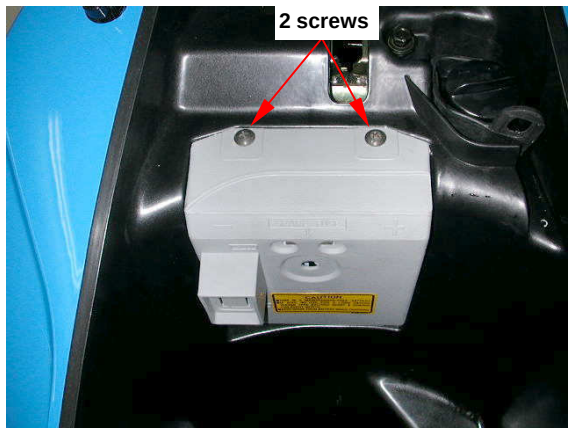
Remove luggage box mounting nuts and bolt (2 nuts & 1 bolt).
Hold the luggage box in both front and rear sides by two hands, and then lift up the box to remove it.

Installation

Install in reverse order of removal procedures.

Battery Cover Removal / Installation

Remove 2 screws, and then remove battery cover.

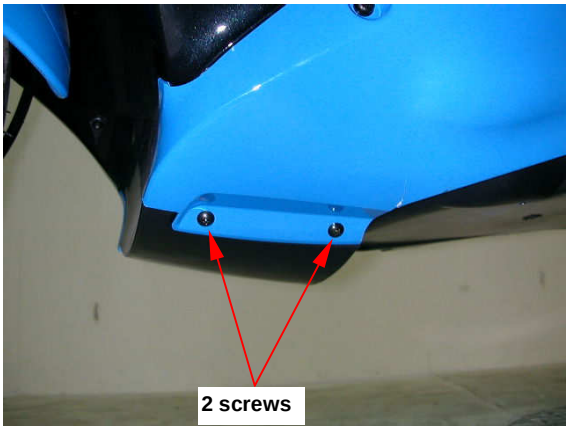


Install in reverse order of removal procedures.

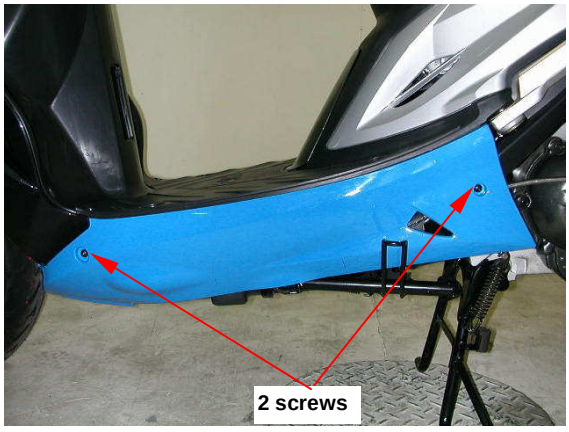
Side Covers

Removal

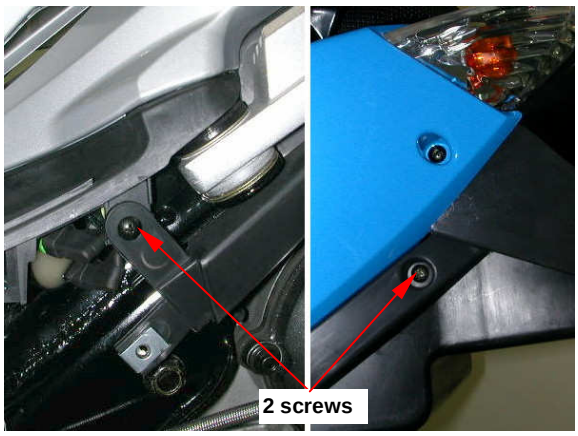
Remove 2 screws under side cover front end.



Remove 2 screws, and then slide the side cover backward so that their hooks are out of slots.
Take out the side cover end part and then remove the cover.



Remove 2 screws from rear side cover.



Slide the rear side cover backward so that their hooks are out of slots.
Take out the rear side cover end part and then remove the cover.

Installation

Install in reverse order of removal procedures.

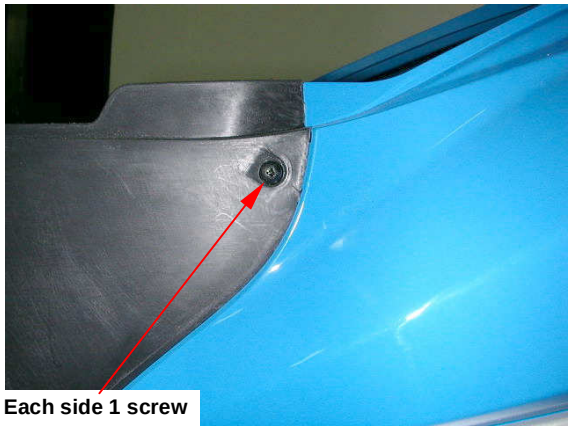
⚠ Caution

The tail of each cover is held with buckles and slot, never pull them with force, or it would crack the buckles.

Center Cover

Removal

Remove 2 screws from center cover.
Slide the center cover frontward so that their hooks are out of slots.
Take out the center cover end part and then remove the cover.



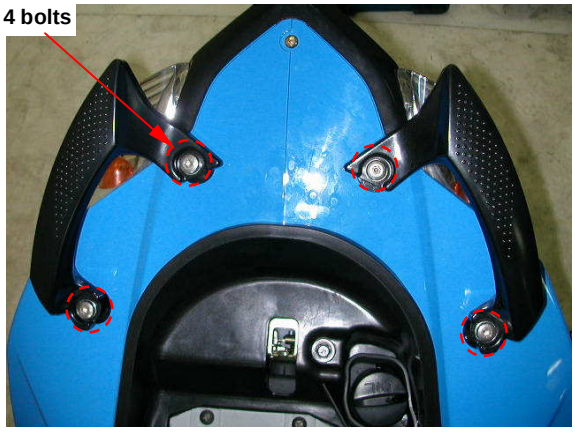
Installation

Install in reverse order of removal procedures.

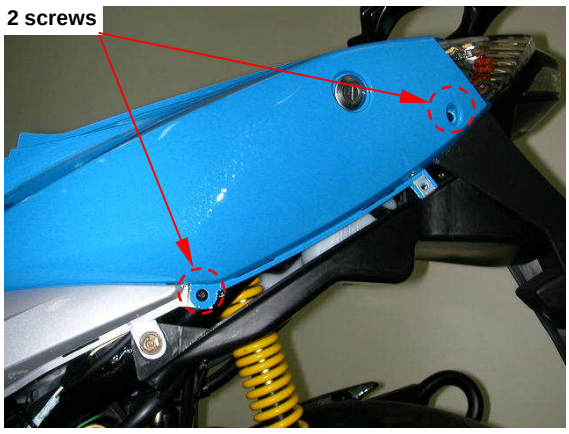
Body Cover

Removal

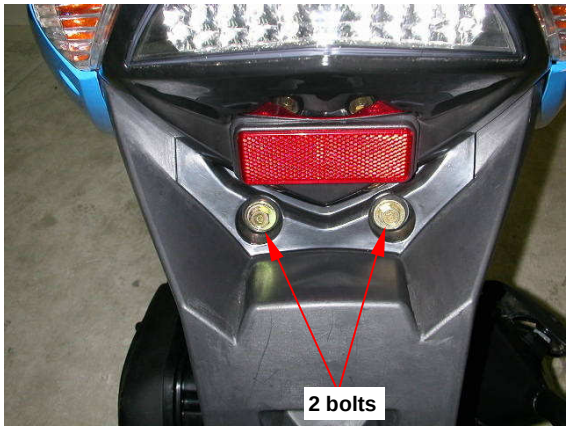
Remove luggage box and center cover.
Remove 4 bolts from rear carrier, and then remove rear carrier.



Remove 4 screws from right and left body cover.



Remove 2 bolts from the rear fender.
Slide the body covers and taillight backward so that their hooks are out of slots.
Take out the body covers and taillight end part and then remove the covers.



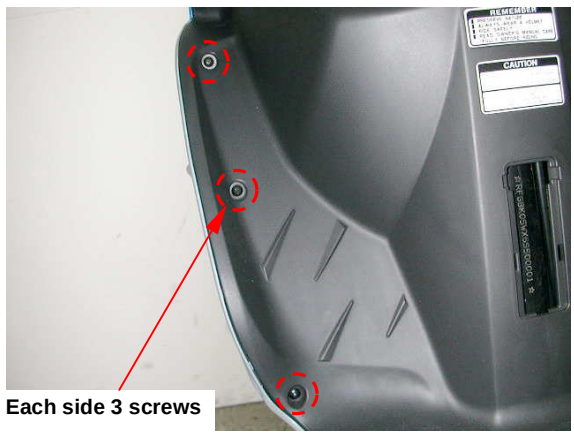
Installation

Install in reverse order of removal procedures.

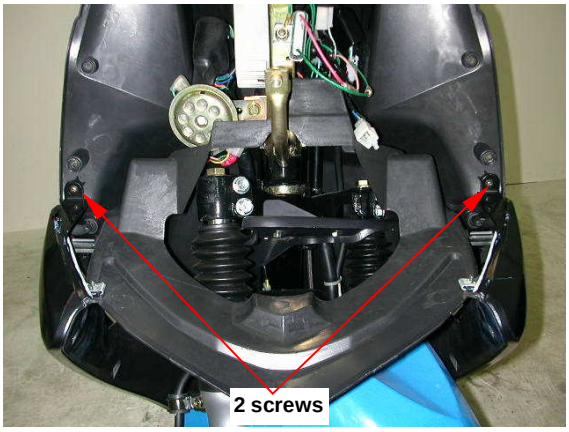
Front under Spoiler

Removal

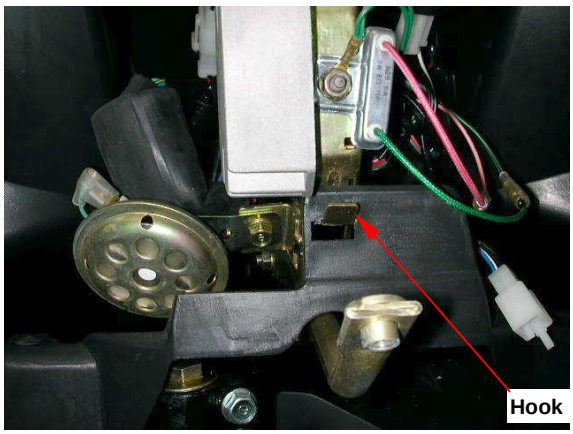
Remove front cover and right / left side covers.
Remove front wheel and front fender.
Remove 6 screws from the front inner box.



Remove 2 screws from the front upper part of the front spoiler and the front inner box.

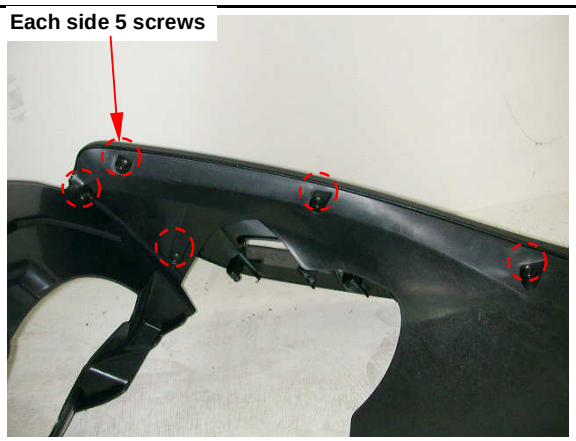


Pull up the front inner spoiler from holder hook, and then remove the front inner spoiler and right / left under spoiler assembly.



Disassembly

Remove 10 screws, and then remove right / left under spoiler.



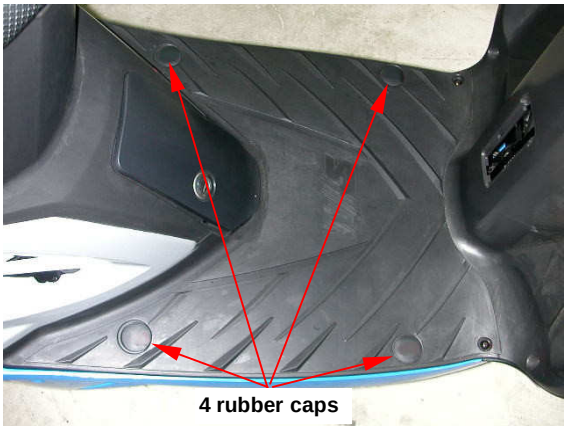
Installation

Install in reverse order of removal procedures.

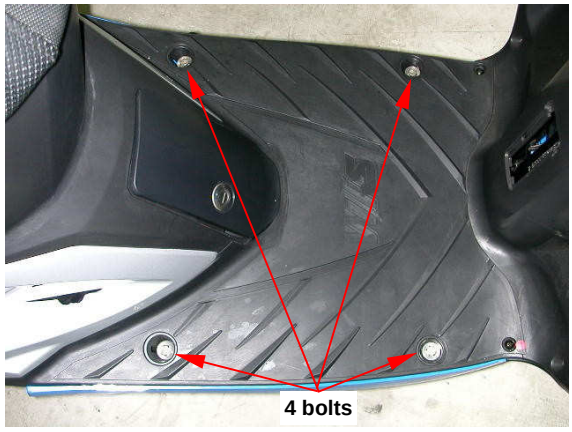
Floor Panel

Removal

Remove luggage box, rear carrier, center cover, right & left side cover and body covers.
Remove 4 rubber caps.

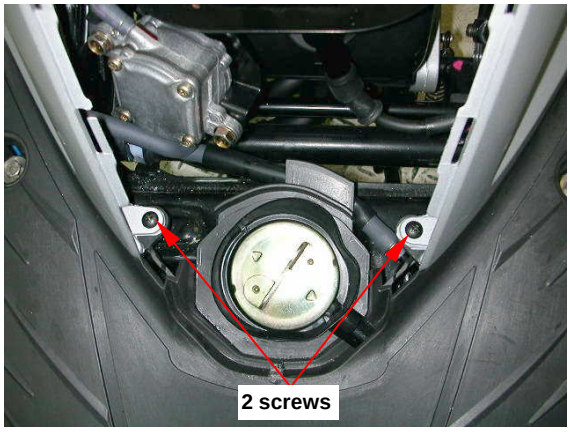


Remove the floor panel. (4 bolts)

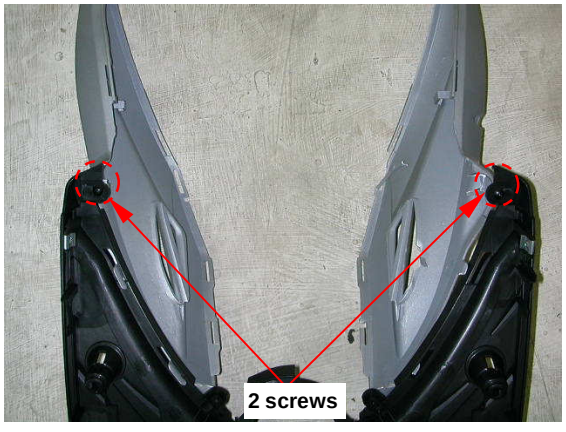


Disassembly

Remove 2 screws from right / left center cover and floor panel.



Remove 2 screws from right / left center cover and floor panel other side.
Remove right / left center cover.



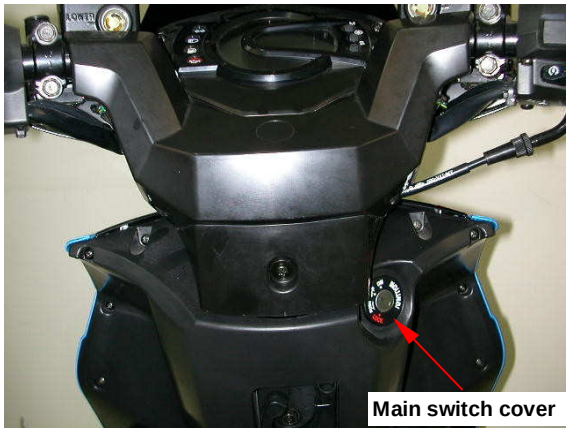
Installation

Install in reverse order of removal procedures.

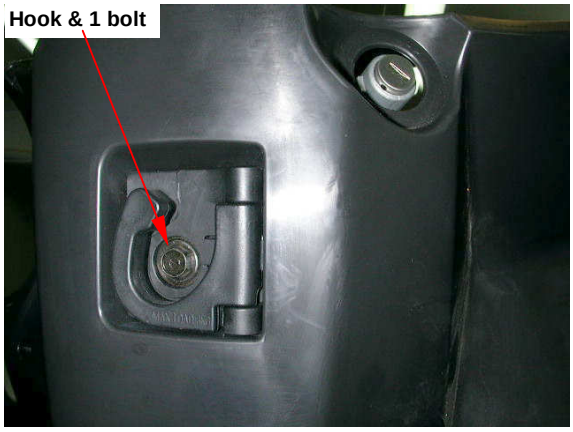
Front Inner Box

Removal

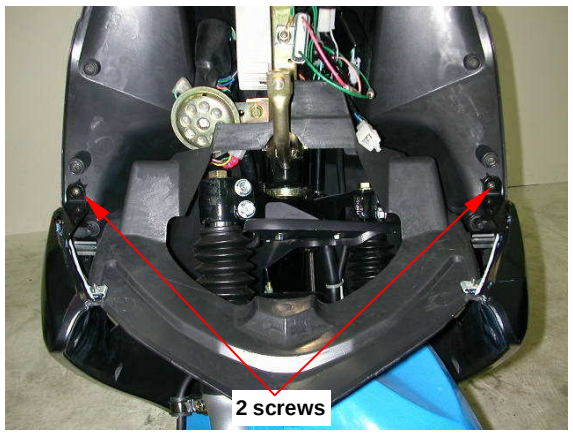
Remove the front cover.
Remove luggage box, rear carrier, center cover, right & left side cover, body covers, and floor panel.
Remove main switch cover.



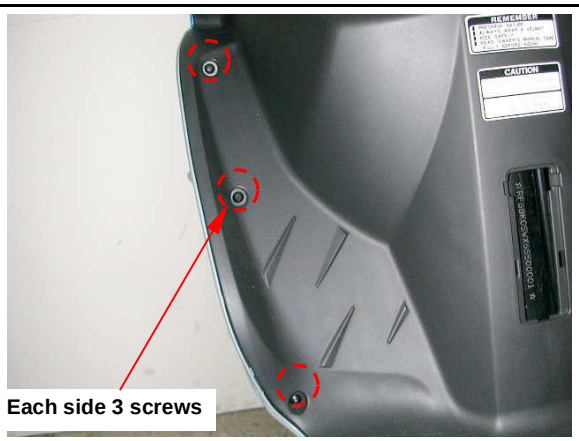
Remove 1 bolt and hook.



Remove 2 screws from the under spoiler and front inner box.



Remove 6 screws from the front inner box and under spoiler.
Remove the front inner box.



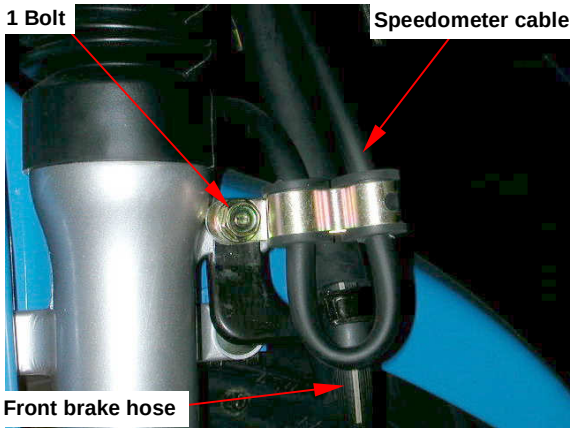
Installation

Install in reverse order of removal procedures.

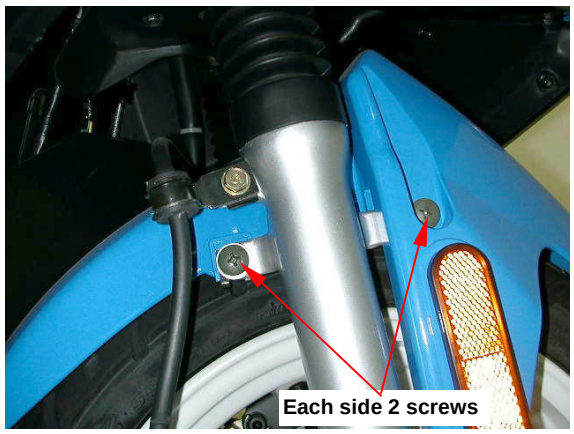
Front Fender

Removal

Ramoval 1 bolt from left front cushion, and then remove speedometer cable clamp and front brake hose clamp.



Ramoval 4 screws form front fender right and left side.
Ramoval front fender.



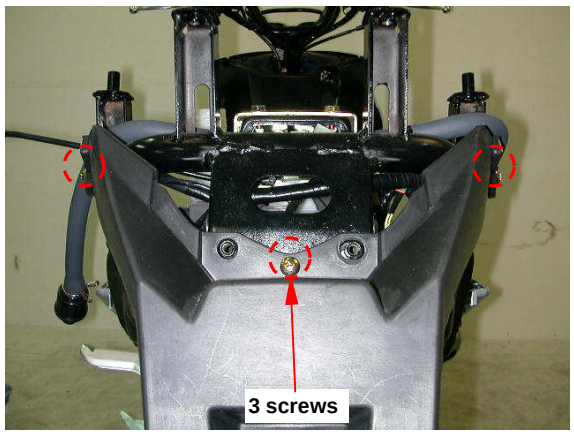
Installation

Install in reverse order of removal procedures.

Rear Fender

Removal

Ramoval luggage box, rear carrier and body covers.
Ramoval 3 screws, and then removal rear fender.



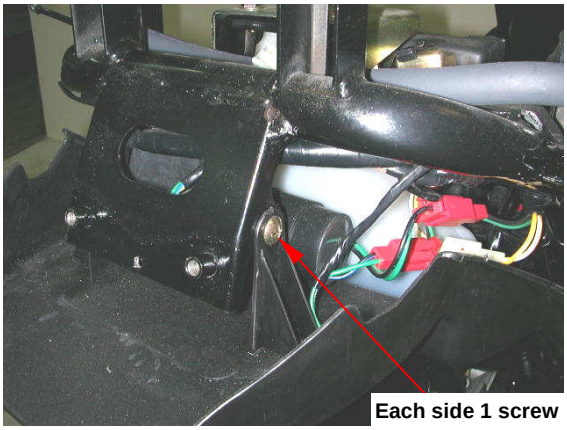
Installation

Install in reverse order of removal procedures.

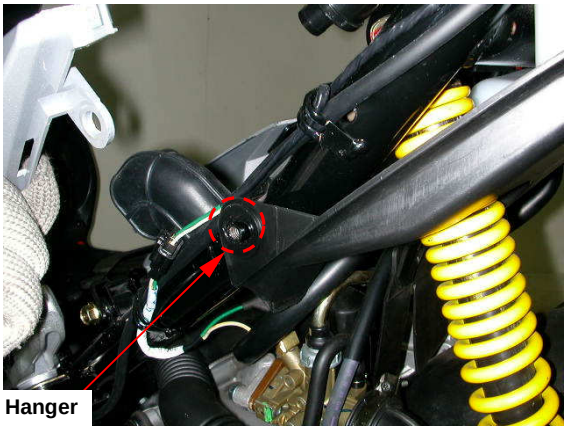
Rear Inner Fender

Removal

Ramoval luggage box, rear carrier, body covers and rear fender.
Ramoval 2 screws from rear inner fender upper.



Pull out rear fender front hanger with frame, and then removal rear inner fender.



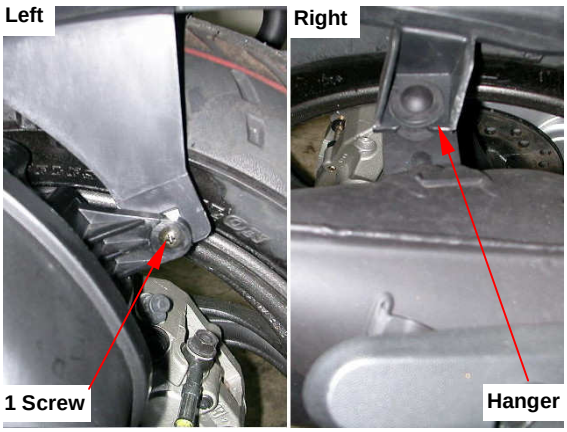
Installation

Install in reverse order of removal procedures.

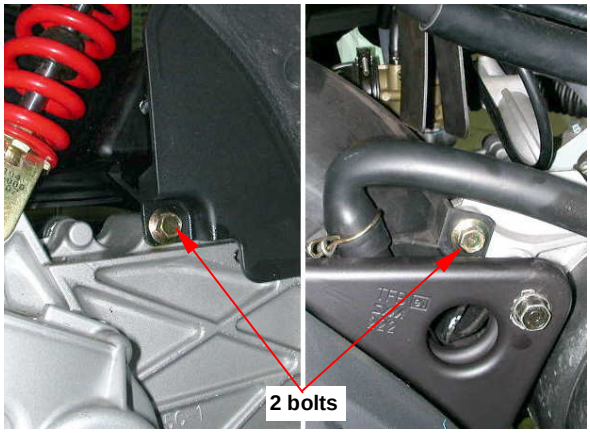
Rear Mudguard

Removal

Ramoval rear mudguard left side screw with air cleaner.
Ramoval muffler (2 nuts & 3 bolts), pull out muffler with rear mudguard right side hanger.



Ramoval rear mudguard right side bolt, and then remove rear wheel.
Ramoval bolts form rear mudguard left side, and then remove rear mudguard.



Installation

Install in reverse order of removal procedures.

Under Cover

Removal

Remove right and left side cover.
Remove 1 bolt and 1 nut from the under cover right side.

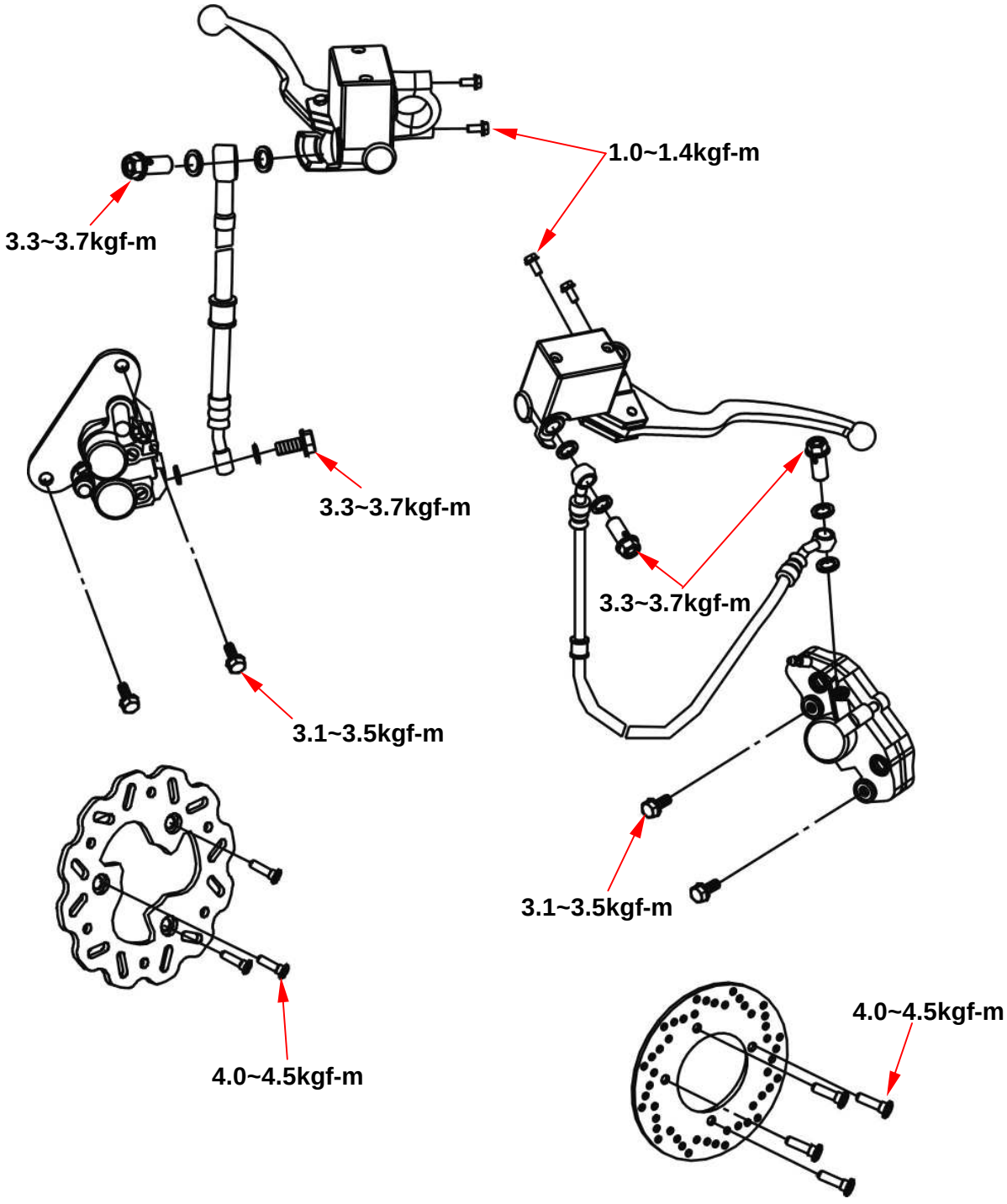
Remove 1 bolt and 1 nut from the under cover left side, and then remove under cover.

Installation

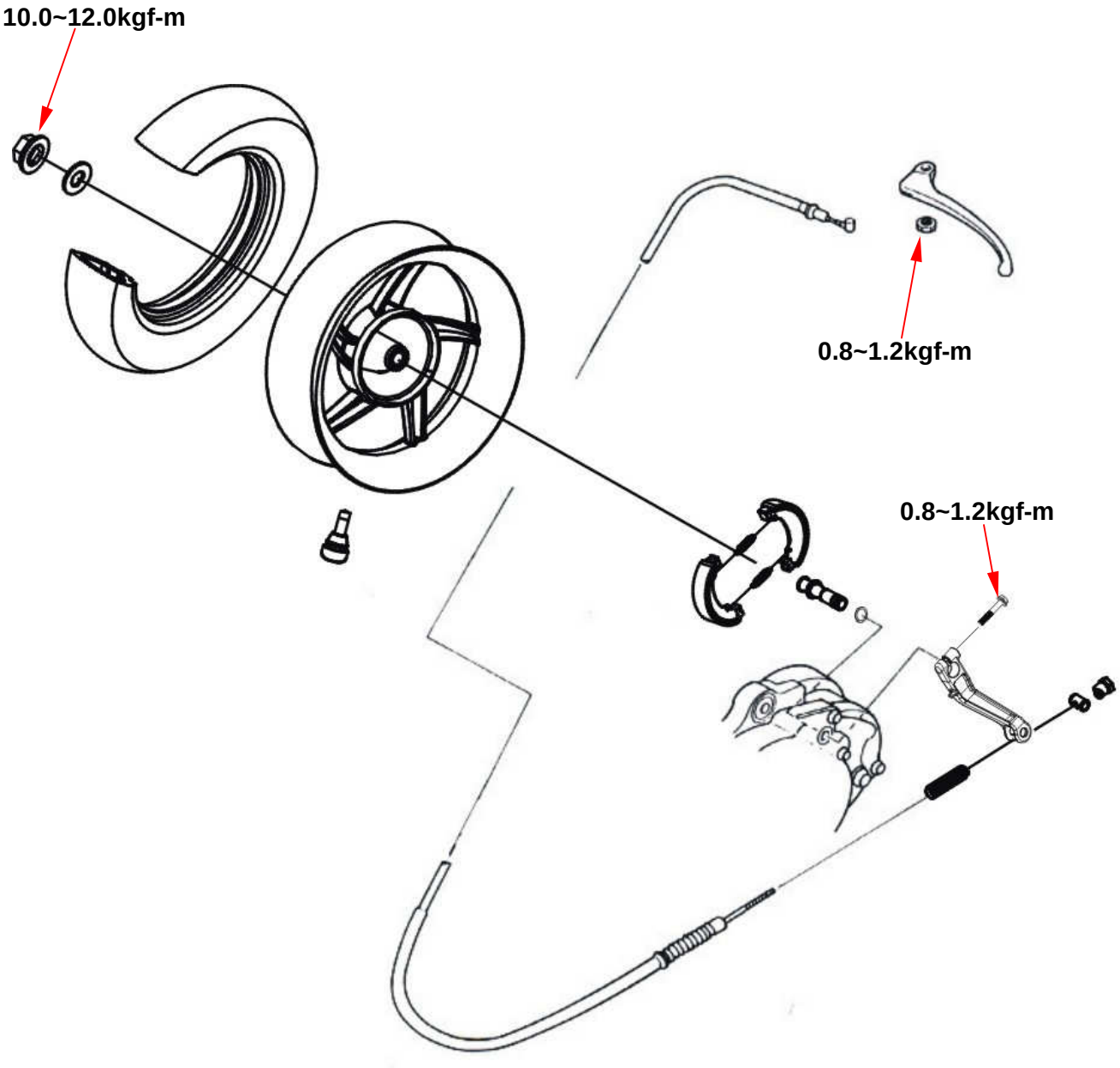
Install in reverse order of removal procedures.

Disc Brake System ····· 12-1	Disc Brake - Caliper ····· 12-8
Rear Drum Brake System ····· 12-2	Brake pad replacement ····· 12-8
Maintenance Information ····· 12-3	Brake Disc ····· 12-10
Troubleshooting ····· 12-5	Disc Brake - Master Cylinder ····· 12-10
Hydraulic Disc Brake ····· 12-6	Rear Drum Brake ····· 12-12
Disc Brake -Air Bleed ····· 12-7	

Disc Brake System



Rear Drum Brake System



Maintenance Information

Precautions in Operation

⚠ Caution

Inhaling brake lining ashes may cause disorders of respiration system, therefore, never use air hose or dry brush to clean brake parts. Use vacuum cleaner or other authorized tool instead.

- The brake caliper can be removed without removing the hydraulic system.
- After the hydraulic system is removed, or the brake system is felt to be too soft, bleed the hydraulic system.
- While refilling brake fluid, care should be taken not to let the foreign material entering into the brake system.
- Do not spill brake fluid on the painted surfaces, plastic or rubber parts to avoid damage.
- Check the operation of the brake system before you go.

Specifications

Item	Standard (mm)	Limit (mm)
The thickness of front brake disc	4.0	3.5
The thickness of rear brake disc	3.5	3.0
Front brake disc run-out	< 0.10	0.3
Front brake master cylinder inner diameter	12.700 ~ 12.743	12.750
Front brake master cylinder piston outer diameter	12.657 ~ 12.684	12.654
Rear brake master cylinder inner diameter	11.000 ~ 11.043	11.050
Rear brake master cylinder piston outer diameter	10.657 ~ 10.684	10.654
OD of front brake disc	190.0	-
OD of rear brake disc	110.0	-
ID of rear brake drum	110.0	110.5
Thickness of front brake lining	4.0	2.0
Thickness of rear brake lining	4.0	2.0

Torque values

Brake hose bolt	3.3~3.7kgf-m
Bolt for brake caliper	3.1~3.5kgf-m
Bolts for the lining guide pin	1.5~2.0kgf-m
Air-bleed valve	0.8~1.0kgf-m
Bolts for the brake disc	4.0~4.5kgf-m
Nuts for the front wheel axle	5.0~7.0kgf-m
Nuts for the rear wheel	10.0~12.0kgf-m
Bolt for rear brake arm	0.8~1.2kgf-m
Rear brake lever nuts	0.8~1.2kgf-m
Brake master cylinder mounting bolts	1.0~1.4kgf-m

Troubleshooting

Disc Brake

Soft brake lever

1. Air inside the hydraulic system
2. Hydraulic system leaking
3. Worn master piston
4. Worn brake pad
5. Poor brake caliper
6. Worn brake lining/disc
7. Low brake fluid
8. Blocked brake pipe
9. Warp/bent brake disc
10. Bent brake lever

Hard operation of brake lever

1. Blocked brake system
2. Poor brake caliper
3. Blocked brake pipe
4. Seized/worn master cylinder piston
5. Bent brake lever

Uneven brake

1. Dirty brake lining/disc
2. Poor wheel alignment
3. Clogged brake hose
4. Deformed or warped brake disc
5. Restricted brake hose and fittings

Tight brake

1. Dirty brake lining/disc
2. Poor wheel alignment
3. Deformed or warped brake disc

Brake noise

1. Dirty lining
2. Deformed brake disc
3. Poor brake caliper installation
4. Imbalance brake disc or wheel

Drum Brake

Poor brake performance

1. Improper brake adjustment
2. Worn brake lining
3. Worn brake drum
4. Worn brake cam
5. Improper brake lining installation
6. Seized brake cable
7. Dirty brake lining
8. Dirty brake drum
9. Brake pad worn in brake cam area.
10. Poor contact between brake arm and camshaft indent

Tight operation or low return speed of brake lever

1. Worn/broken/crack return spring
2. Worn drum
3. Dirty brake lining
4. Brake seized caused from dirty brake drum
5. Seized brake cable
6. Worn brake cam
7. Improper brake lining installation

Brake noise

1. Worn brake lining
2. Worn drum
3. Dirty brake lining
4. Dirty brake drum

Hydraulic Disc Brake

Close the drain valve of the hydraulic disc brake.
Replace the brake fluid.
Before the brake fluid reservoir is removed, turn the handle so that the brake fluid reservoir becomes horizontal, and then remove the brake fluid reservoir.
Cover the painted surfaces, plastic or rubber components with a rag when servicing brake system.

⚠ Caution

Spilled brake fluid on painted surfaces, plastic or rubber components may result in their damages.

Remove the master cylinder cap and diaphragm.
Use brake fluid to clean the dirty brake disc.

⚠ Caution

The dirty brake lining or disc will reduce the brake performance.

Refill up same grade brake fluid into the reservoir.

⚠ Caution

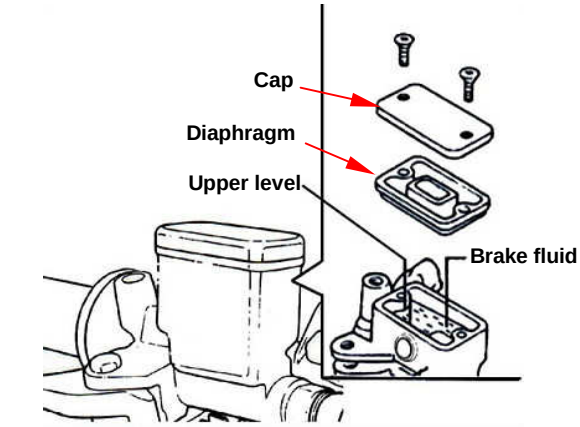
To mixed non-compatible brake fluid will reduce brake performance. Foreign materials will block the system causing brake performance to be reduced or totally lost.

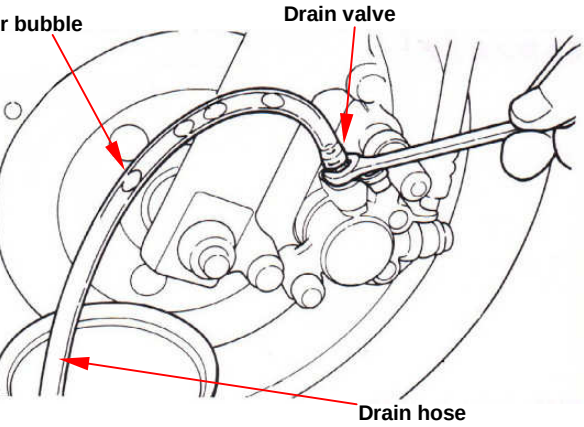
Connect drain hose to drain valve.
Open the drain valve on the caliper and operate the brake lever until the old brake fluid is entirely drained out. Close the drain valve and add specified brake fluid into the brake master cylinder.
Recommended brake fluid: WELLRUN DOT 3 brakes fluid

⚠ Caution

To reuse the spent brake fluid will affect brake performance.

Connect one end of transparent hose to the drain valve, and put the other end into a container.
Open the drain valve around 1/4 turns, and at the same time hold the brake lever until the there is no air bubble in the drain hose and also feeling resistance on the brake lever.
Close the drain valve when finishing the brake system refilling fluid procedure, and operate the brake lever to check whether air bubble is in brake system or not. If brake is still soft, please bleed the system as described below.





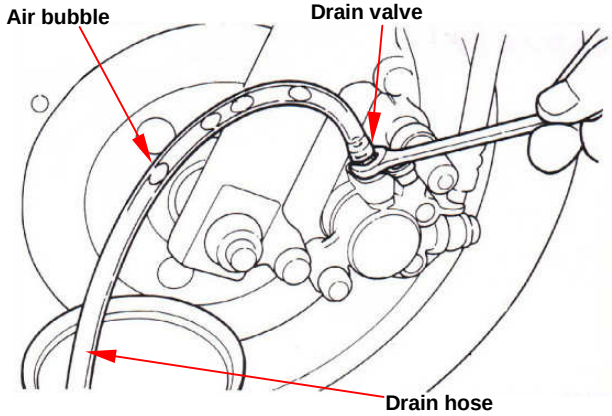
Disc Brake -Air Bleed

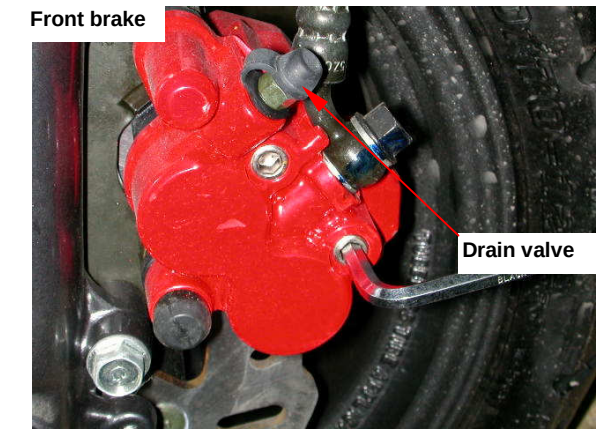
Tightly hold the brake lever and open the drain valve around 1/4 turns, and then close the valve.

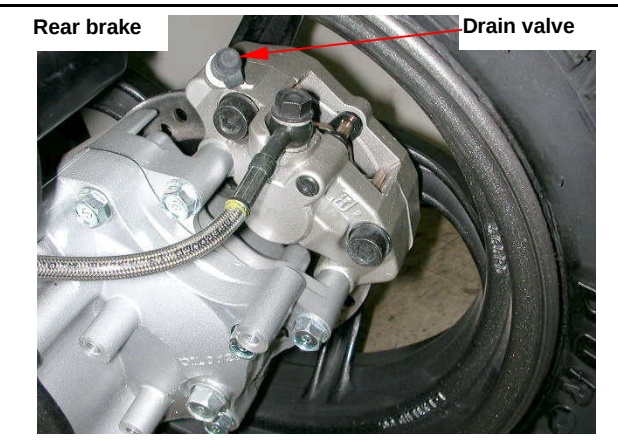
⚠ Caution

- Do not release the brake lever before the drain valve is closed.
- Always check the brake fluid level when carrying out the air bleeding procedure to avoid air enters into the system.

Slowly release the brake lever, and wait for a few seconds until it reaches its top position.
Repeat the steps 1 and 2 until there is no air bubble at the end of the hose.
Tightly close the drain valve.
Make sure the brake fluid is in the UPPER level of the master cylinder, and refill the fluid if necessary.
Cover the cap.







Disc Brake - Caliper

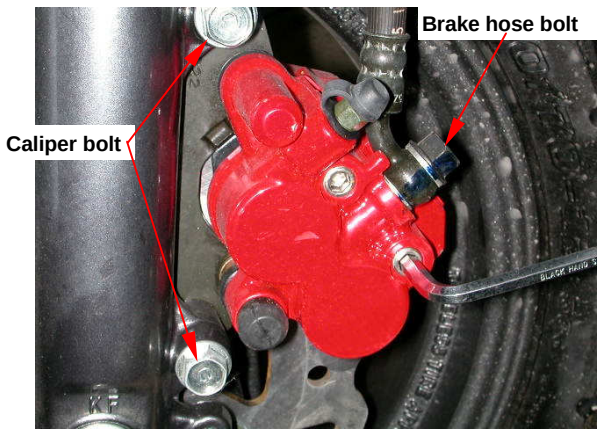
Removal

Place a container under the brake caliper, and loosen the brake hose bolt and finally remove the brake hoses.

⚠ Caution

Do not spill brake fluid on painted surfaces.

Remove two caliper bolts and the caliper.



Installation

Install the brake caliper and tighten the attaching bolts securely.

Torque: 3.1~3.5kgf-m

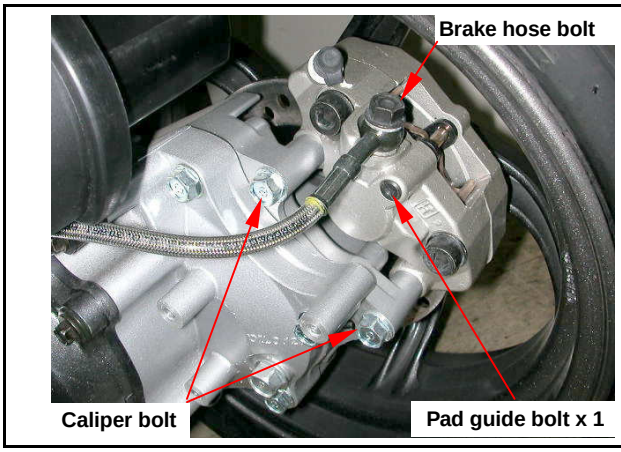
⚠ Caution

- Use M8 x 35 mm flange bolt only.
- Long bolt will impair the operation of brake disc.

Use two seal washers and hose bolts to lock the hose and brake caliper in place.

Torque: 3.3~3.7kgf-m

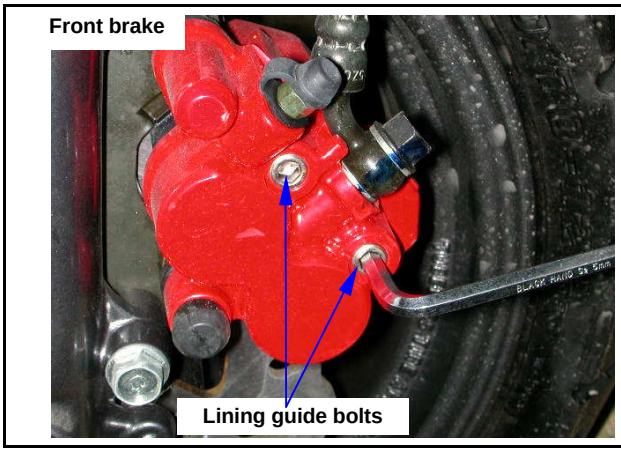
Refill up the brake fluid to the reservoir and make necessary air bleeding.



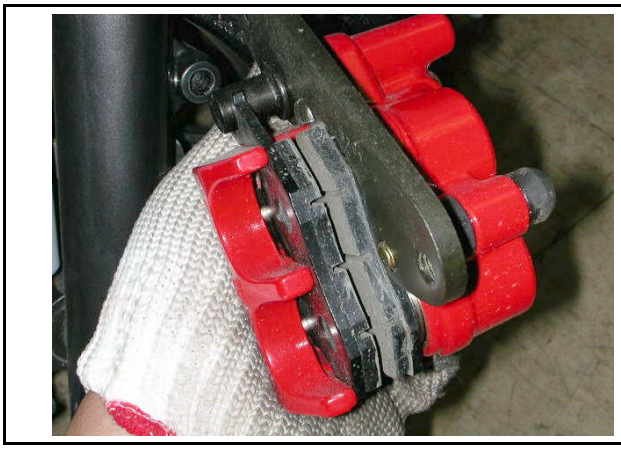
Brake pad replacement

Front brake

Loosen the 2 pad guide pin bolts.
Remove brake caliper.



Remove the brake pad guide pin bolts, and then remove brake pads.



Install the new brake pads onto brake caliper.

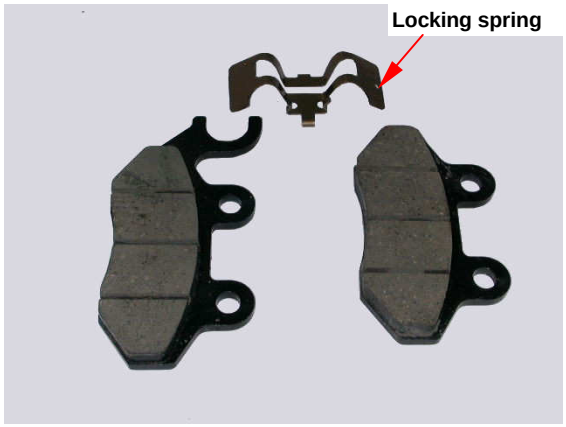
Install the brake pad guide pin bolts.

Install the brake caliper and tighten the mounting bolts.

Torque: 3.3~3.7kgf-m

Tighten the lining guide pin bolts.

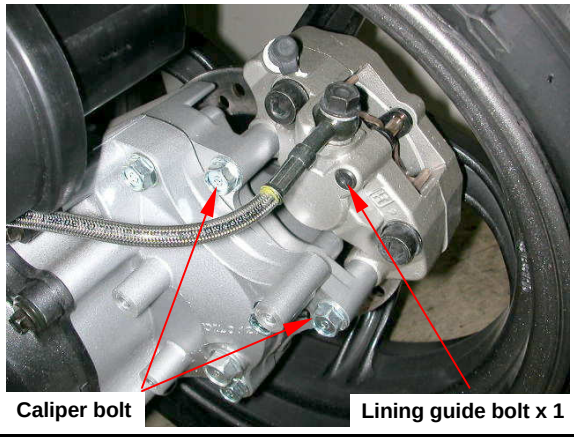
Torque: 1.5~2.0kgf-m



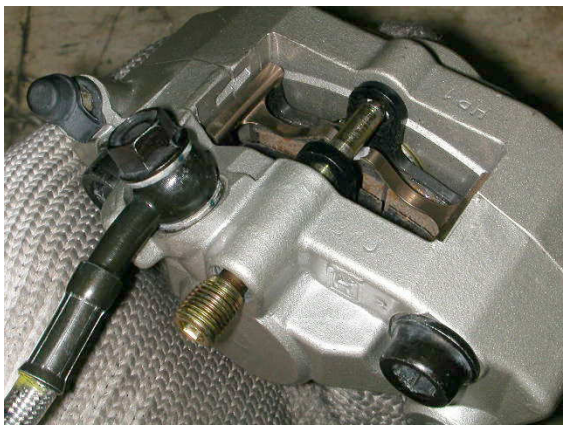
Rear brake

Loosen the 1 lining guide pin bolt.

Remove brake caliper.



Remove the brake pad guide pin bolt and locking spring, and then remove brake pads.



Install the new brake pads onto brake caliper.

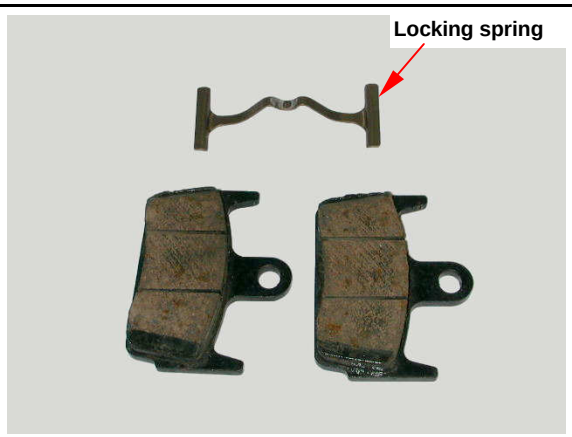
Install the brake pad guide pin bolt and.

Install the brake caliper and tighten the mounting bolts.

Torque: 3.3~3.7kgf-m

Tighten the lining guide pin bolt.

Torque: 1.5~2.0kgf-m



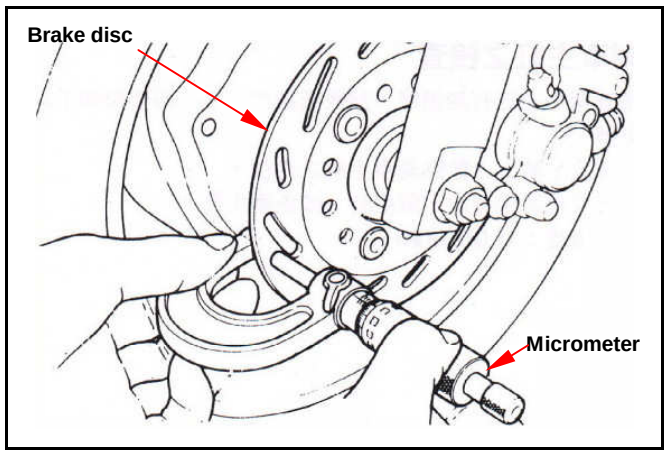
Brake Disc

Inspection

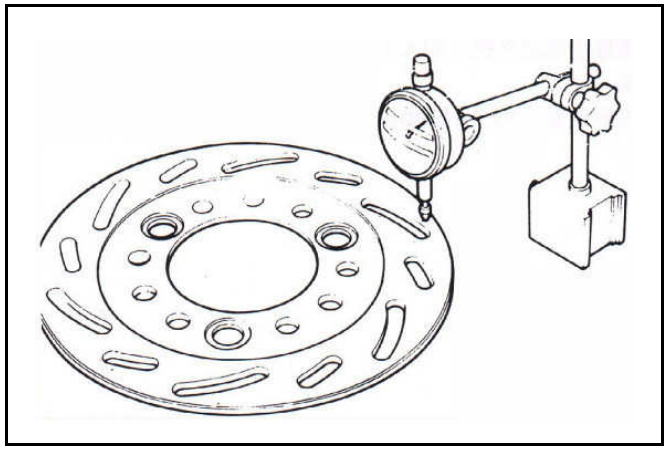
Visually check the brake disc for wear or break.
Measure the thickness of the disc at several places. Replace the disc if it has exceeded the service limit.

Allowable limit:

Front brake disc	**3.5mm**
Rear brake disc	**3.0mm**



Remove the brake disc from wheel.
Check the disc for deformation and bend.
Allowable limit: 0.30 mm



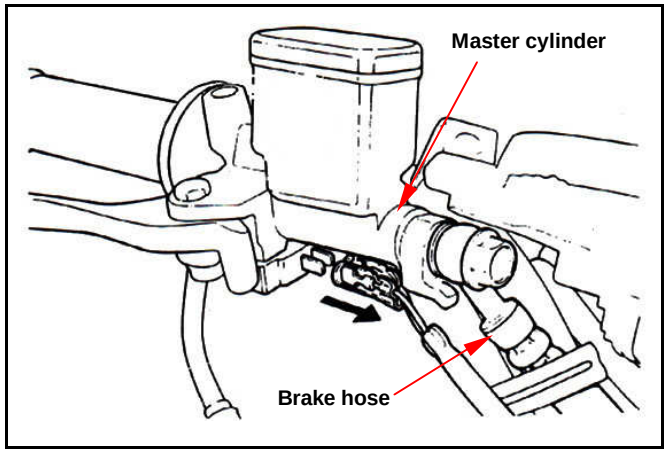
Disc Brake - Master Cylinder

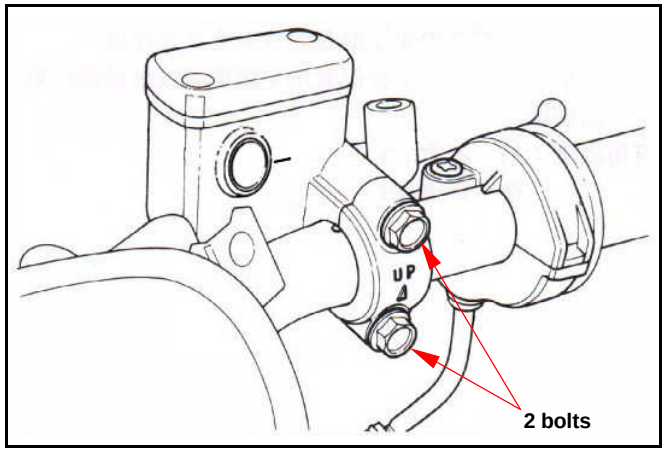
Master Cylinder Removal

⚠ Caution

- Do not let foreign materials enter into the cylinder.
- The whole set of master cylinder; piston, spring, diaphragm and cir clip should be replaced as a set.

Remove the leads of brake light switch.
Drain out the brake fluid.
Remove the brake lever from the brake master cylinder.
Remove the brake hose.
Remove the master cylinder seat and the master cylinder.





Remove the rubber pad.
Remove the cir clip.
Remove the piston and the spring.
Clean the master cylinder with recommended brake fluid.

Install the rubber pad into groove properly.

Master Cylinder Inspection

Check the master cylinder for damage or scratch. Replace it if necessary.
Measure the cylinder inner diameter at several points along both X and Y directions.
Replace the cylinder if the measured values exceed allowable limit.

Allowable limit:
Front brake 12.750 mm
Rear brake 11.050 mm

Measure the outer diameter of the piston.
Replace the piston if its measured value exceeds allowable limit.

Allowable limit:
Front brake 12.654 mm
Rear brake 10.654 mm

Master Cylinder Assembly

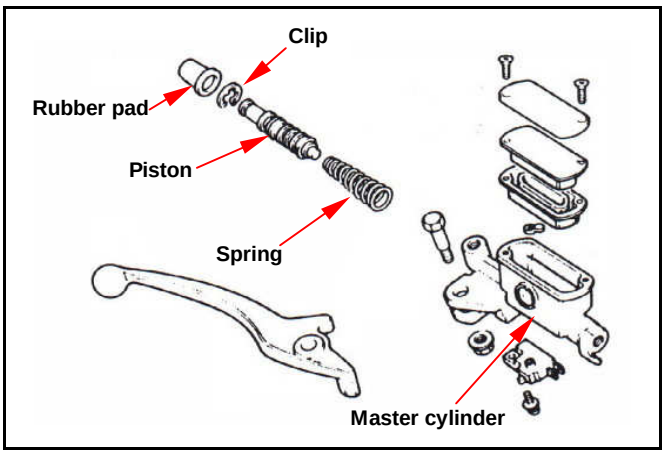
⚠ Caution

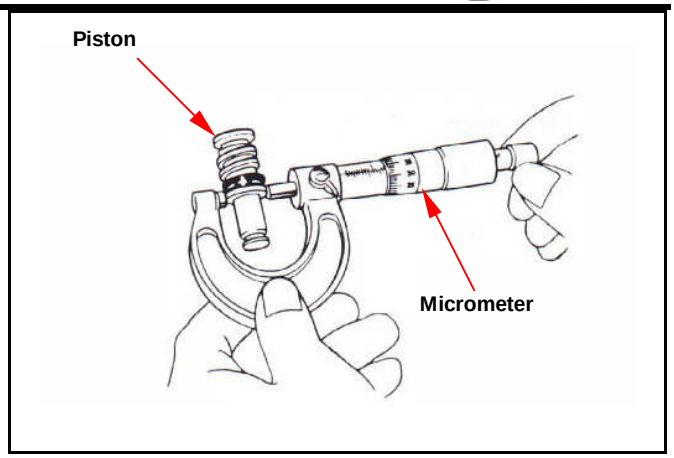
- It is necessary to replace the whole set comprising piston, spring, piston cup, and cir clip.
- Make sure there is no dust on all components before assembling.

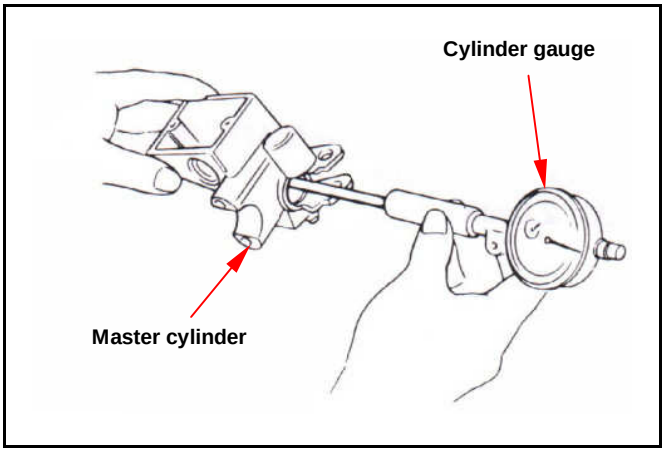
Apply clean brake fluid to the piston cup, and then install the cup onto the piston.
Install the larger end of the spring onto the master cylinder.
The master cup's cavity should be face inside of master cylinder when installing the master cup.
Install the cir clip.

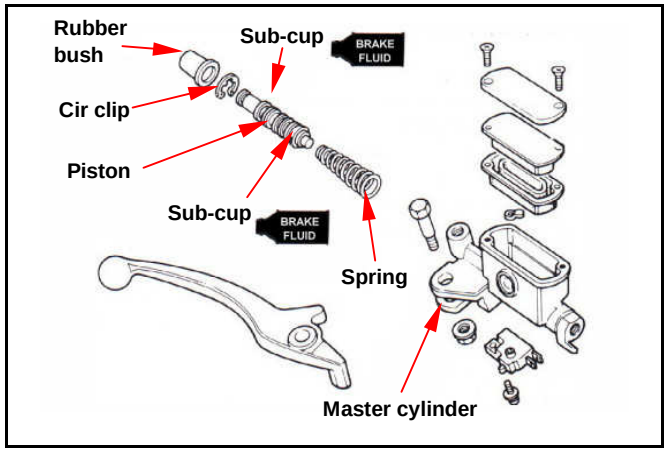
⚠ Caution

- Never install cup lip in the opposite direction.
- Make sure the cir clip is seated securely in the groove.

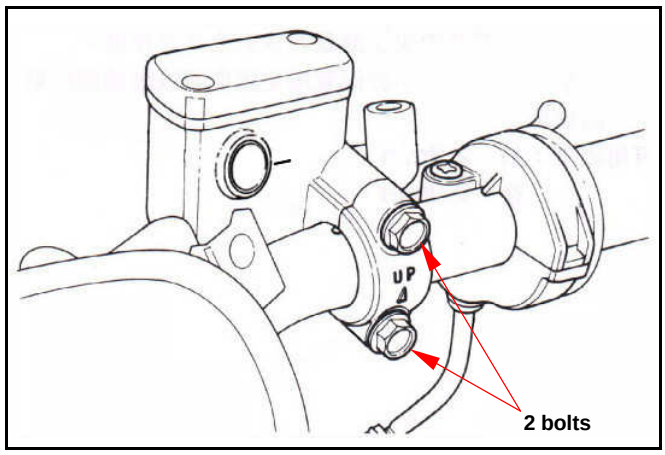

Clip
Rubber pad
Piston
Spring
Master cylinder


Piston
Micrometer

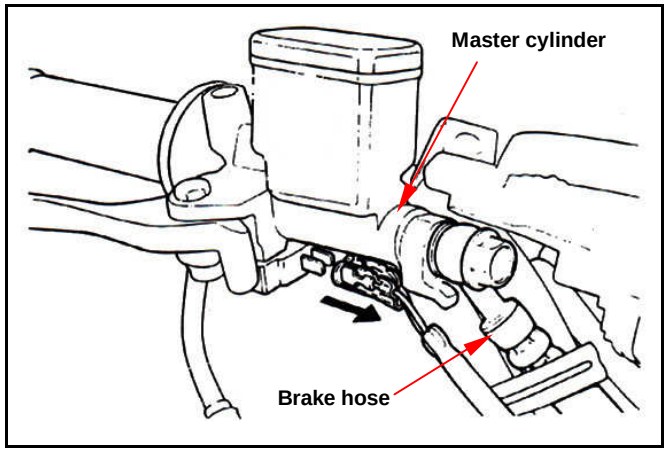

Cylinder gauge
Master cylinder


Rubber bush
Sub-cup
BRAKE FLUID
Cir clip
Piston
Sub-cup
BRAKE FLUID
Spring
Master cylinder

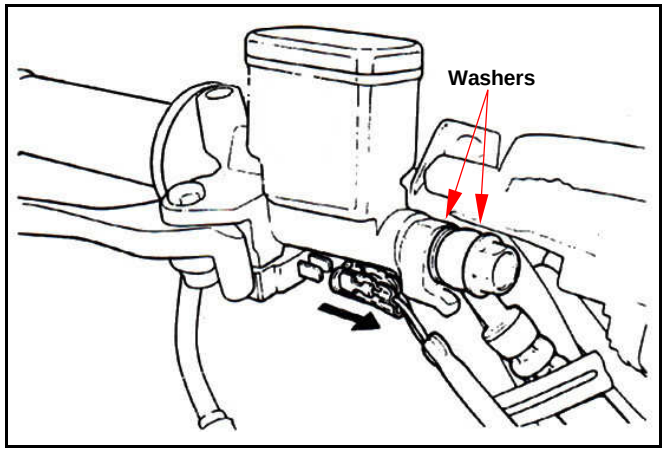
Place the master cylinder onto handlebar, and install the bolts.



Install the brake lever, and connect leads to brake light switch.



Connect brake hoses with 2 new washers.
Tighten the brake hose bolt to the specified torque value.
Make sure the hose is installed correctly.
Install all wires, hoses, and components carefully so avoid to twisting them together.



⚠ Caution

Improper routing may damage leads, hoses or pipes.

⚠ Caution

Kink of brake leads, hose or pipe may reduce brake performance.

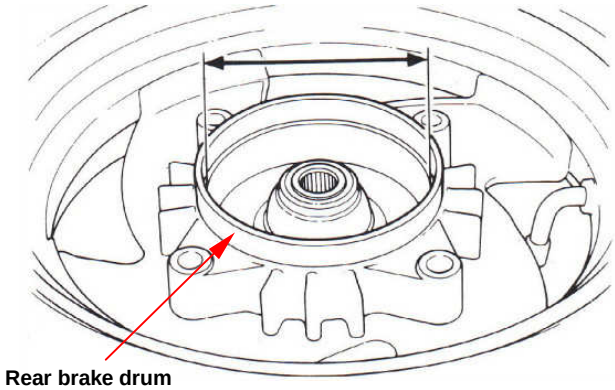
Add specified brake fluid and bleed the system.

Rear Drum Brake

To use vacuum cleaner or other alternatives to avoid danger caused from dusts.

⚠ Caution

- Inhaling brake lining ashes may cause disorders of respiration system, therefore, never use compressed air or dry brush to clean brake parts.
- Brake performance will be reduced by grease on brake lining.



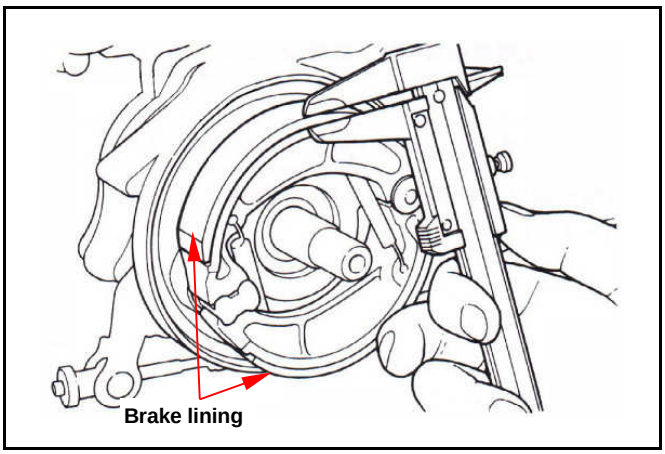
Remove wheel and brake drum.

Inspection

Check brake drum for damage or wear out, and replace it if necessary.
Measure the inner diameter of brake drum and record the max. value.
Allowable limit: rear (110.5mm)

⚠ Caution

- Clean the rust onto the brake drum with #120 sandpaper.
- Measure the inner diameter of brake drum with micrometer.



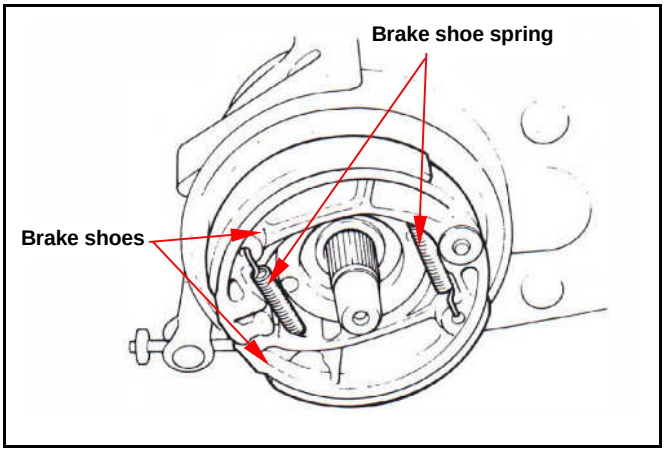
Measure the thickness of brake lining at three points (both ends and center).
If the thickness is less than specified value or if it is contaminated by oil or grease, replace as a set.
Service limit: Rear: 2.0 mm

Removal

⚠ Caution

Brake linings must be replaced as a shoe.

Remove the brake shoes from brake panel.



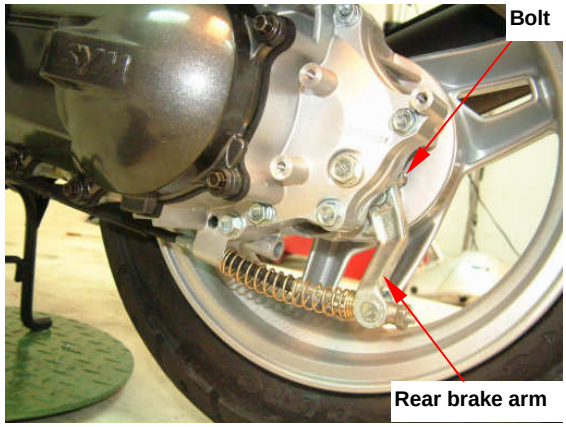
Installation

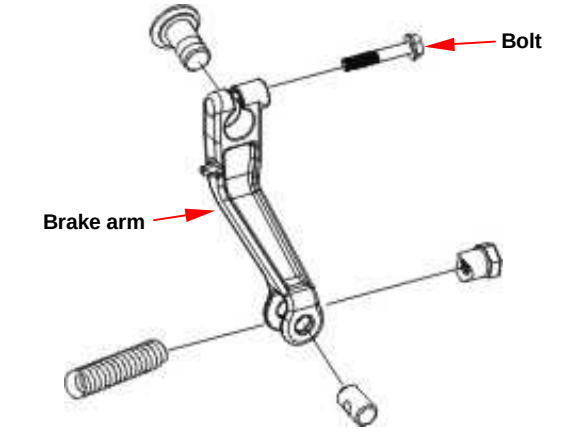
Apply with a thin coat of grease to the brake cam and the anchor pin.
Install brake cam.
Never allow brake linings to be contaminated by oil or grease.
Wipe off the excessive grease from brake cam and the anchor pin.

⚠ Caution

Brake efficiency will be reduced if brake shoe is contaminated by oil or grease.

Install the brake cam and arm after aligning it with the punched point.
Tighten the bolts and nuts to specified torque:
Torque value: 0.8~1.2kgf-m



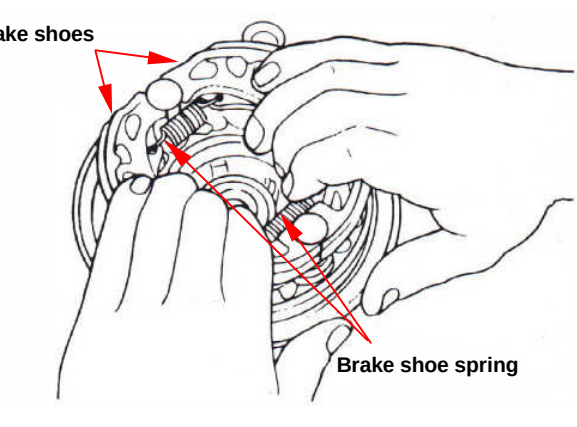


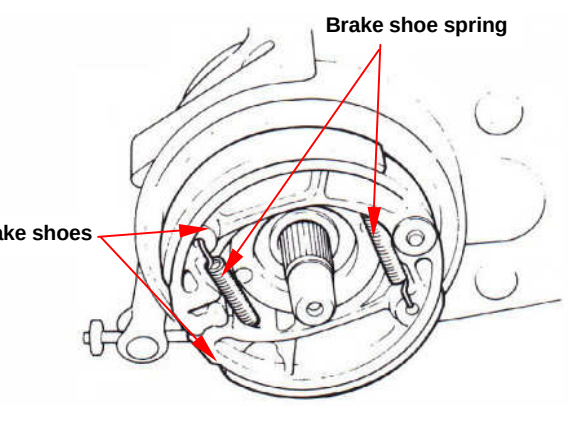
Use a brake cleaner to clean brake hub and replace the two brake shoes if brake linings are contaminated.

⚠ Caution

Brake efficiency will be reduced if brake lining is contaminated by oil or grease.

Install spring onto the brake shoes.
Install the brake shoes to the brake panel one after one, and make sure the shoe springs are in correct position.
Install the wheel.





Notes:

13. Steering / Front Wheel / Front Cushion

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Troubleshooting ····· 3-21	Front Cushion ····· 13-9
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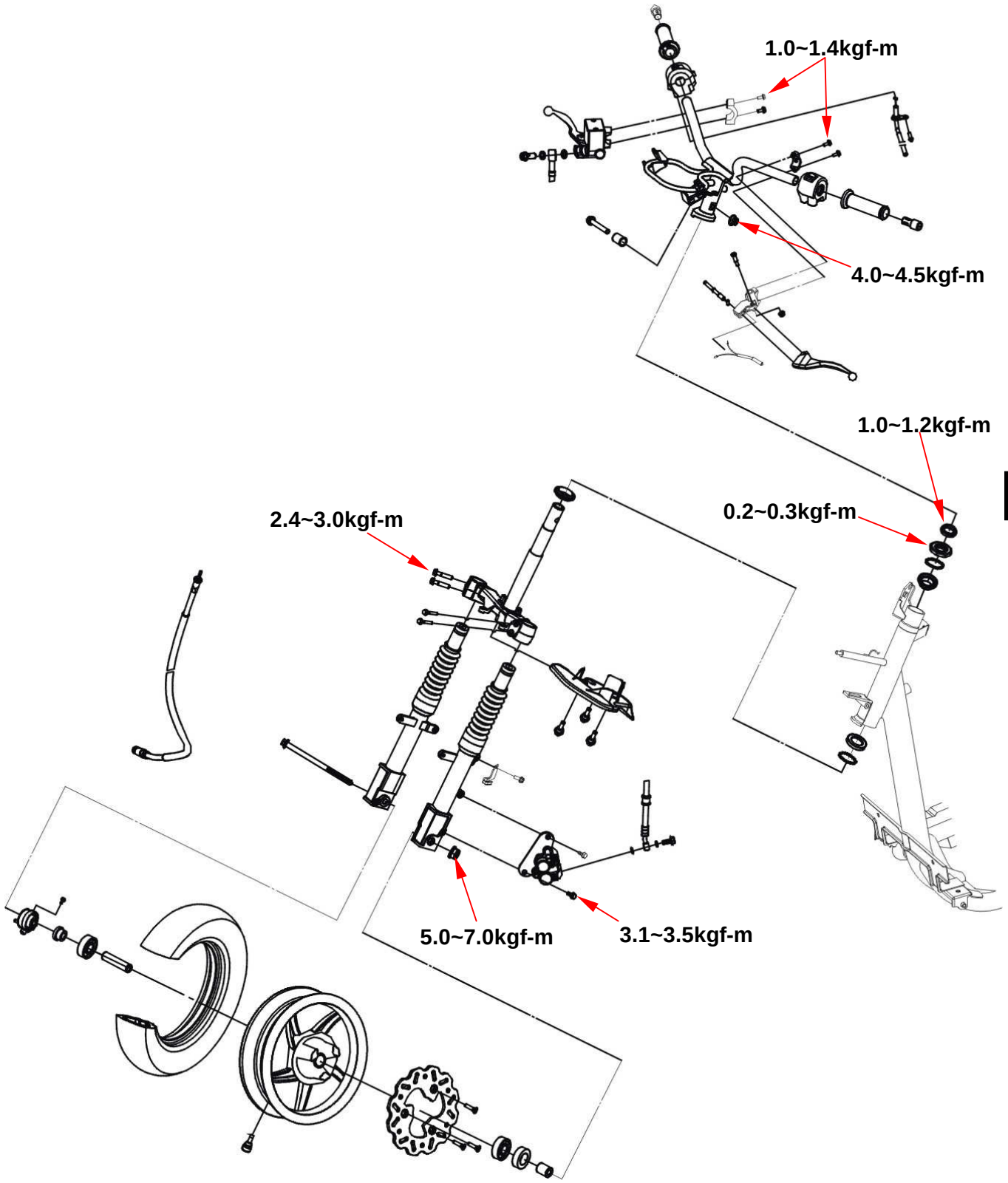


13. Steering / Front Wheel / Front Cushion

Maintenance Information

Specification

Item		Standard value (mm)	Limit (mm)
Shaft bending		—	**0.2 (0.01 in)**
Rim wobbling	Radial	—	**2.0 (0.08 in)**
	Axial	—	**2.0 (0.08 in)**

Torque Value

Steering handle nut	4.0~4.5kgf-m
Brake master cylinder mounting bolts	1.0~1.4kgf-m
Front wheel axle	5.0~7.0kgf-m
Brake disc bolt	4.0~4.5kgf-m
Front cushion mounting nut	2.4~3.0kgf-m
Front brake caliper bolt	3.1~3.5kgf-m
Steering stem mounting nut	1.0~1.2kgf-m
Top cone race	0.2~0.3kgf-m

Special Tools

Inner bearing puller SYM-6204022
Bearing driver 6201

Troubleshooting

Hard To Steer

1. The steering shaft bolt is too tight.
2. The steering shaft bearing are damaged
3. The ball and the top cone of the steering shaft are damaged.
4. Insufficient tire pressure.

The Steering Handle Is Tilted

1. Uneven arrangement of the front cushions.
2. The front fork is bent.
3. The front wheel axle is bent.

The Front Wheel Wobbling

1. The rim is bent.
2. The wheel axle nut is not tightened improperly
3. Bend wheel rim
4. Side-worn or poor tire.
5. The bearing play of the wheel axle is too large.

Soft Cushion

1. Weak front cushion spring

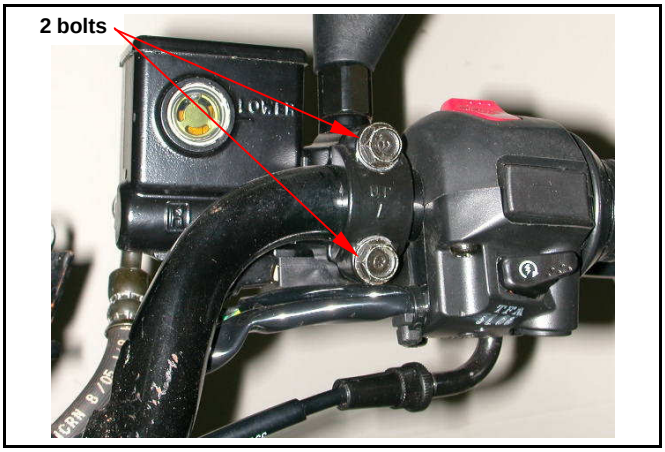
Noise In Front Cushion

1. Cushion outer tube noise
2. The joint of the cushion gets loose.

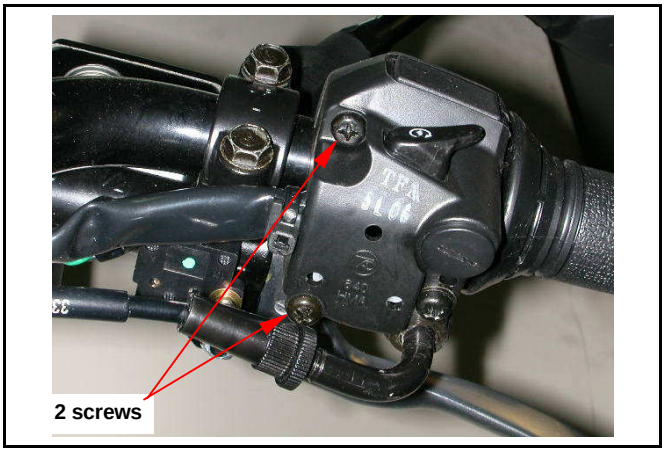
Steering Handle

Removal

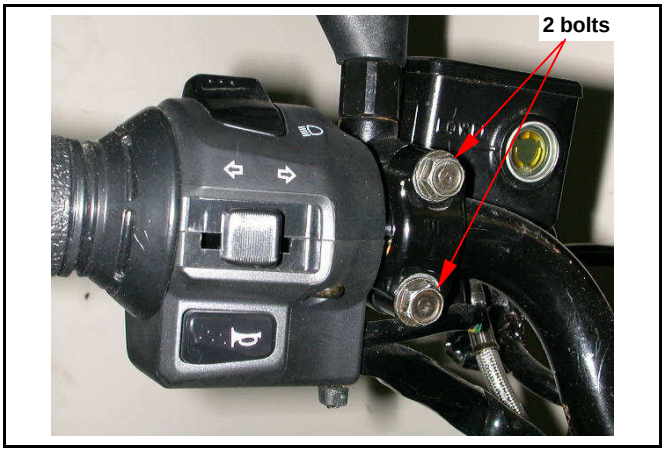
Remove handle cover and front cover (refer to chapter 11).
Remove front brake master cylinder **(disc brake)** after 2 bolts removed.



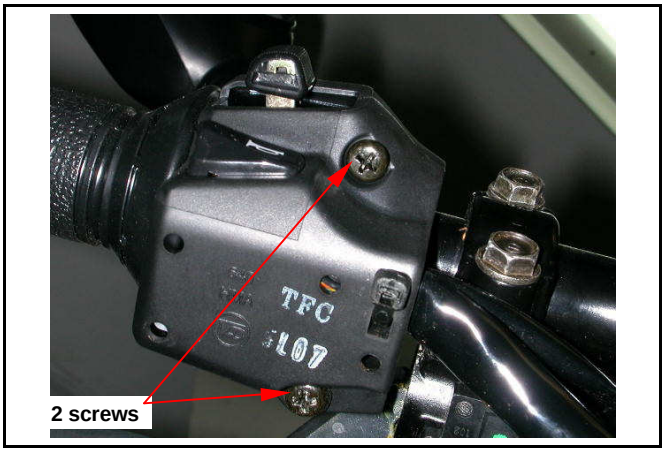
Remove throttle grip and right handle switch after right handle switch mounting screws removed. (2 screws)



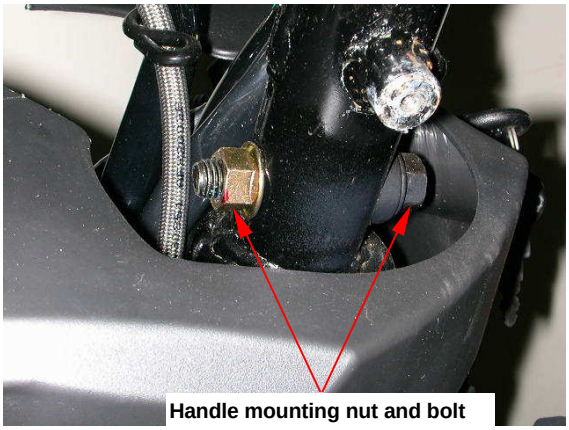
Remove rear brake master cylinder **(disc brake)** after 4 bolts removed.
Remove rear brake lever bracket **(drum brake)** after mounting bolt removed.



Remove left handle switch after left handle switch mounting screws removed. (2 screws)



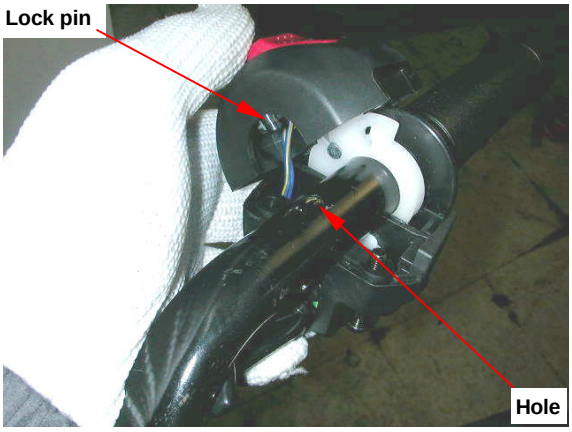
Remove handle mounting bolt and nut, and then remove the handle.



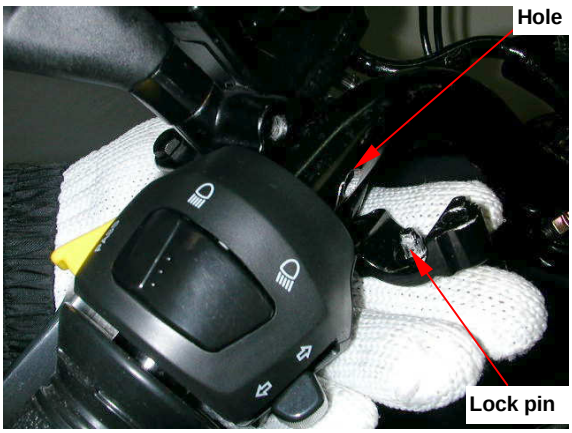
Installation

Installs handle and align with bolt hole.
Install bolt and nut and then tighten it.
Torque value: 4.0~4.5kgf-m

Apply with grease onto throttle cable and the sliding surface of handle grip.
Align the lock pin of the right handle switch with the hole on the handle, and then install the right handle switch.
Tighten the screws. (2 screws)
Align the lock pin of the left handle switch with the hole on the handle, and then install the left handle switch.
Tighten the screws. (2 screws)

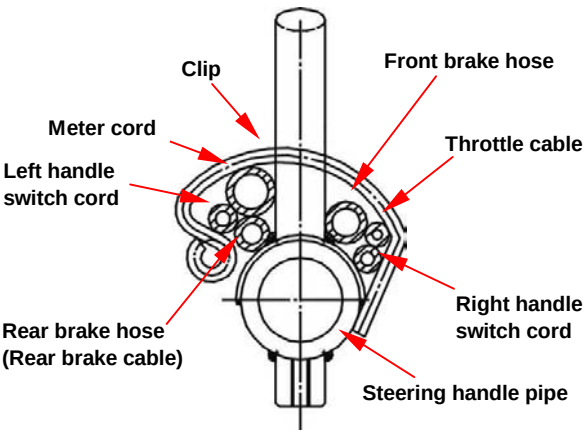


Place master cylinder **(disc brake)** or brake lever bracket **(drum brake)** onto steering handle.
Align the lock pin on mounting holder with lock pin hole on the handle.
Tighten the upper part bolt, and then tighten lower bolt.



Check hoses and cords dispose.
Install all components in reverse order of removal procedures.
Conduct following adjustment:

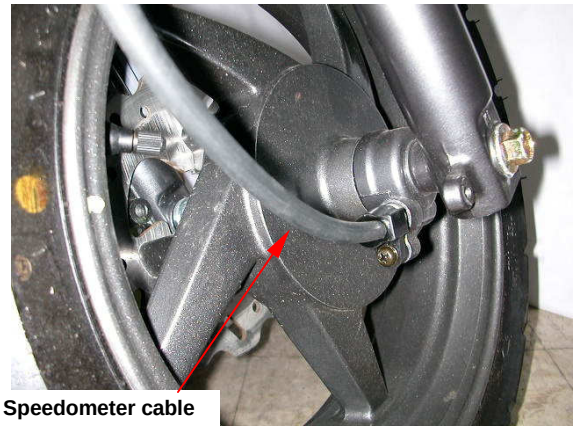
- Oil pump control cable.
- Throttle operation.
- Brake lever free play (drum brake).



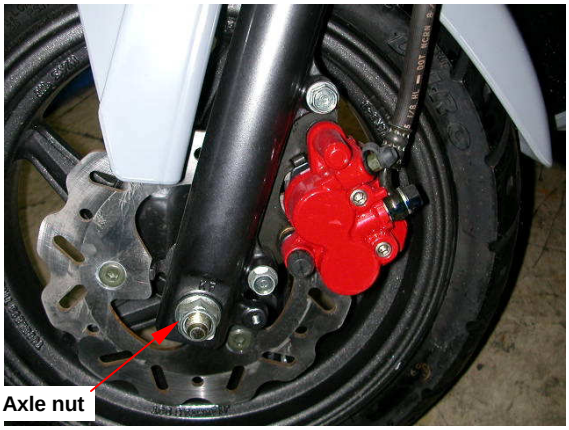
Front Wheel

Removal

Support body bottom and lift front wheel free of ground with a stand.
Remove speedometer cable from speedometer gear box (1 screw).

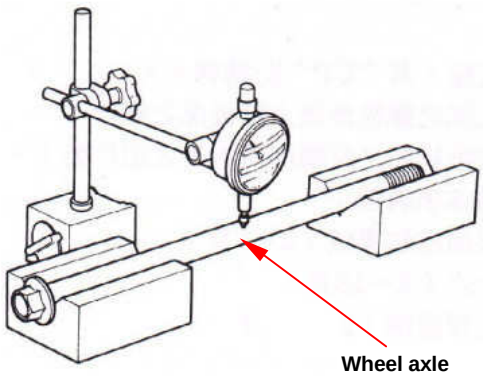


Remove front wheel axle nut, and then pull out the axle and remove the wheel.

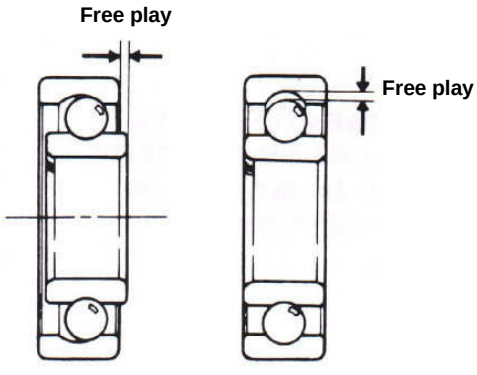


Inspection

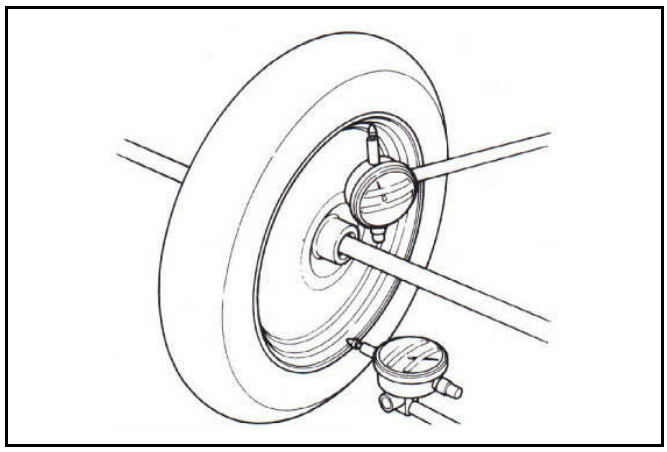
Place the axle onto a V-block to measure its run-out with a dial gauge.
The dial gauge indicated 1/2 run-out.
Service limit: 0.20 mm



Place the wheel on to a rotation seat, and turn the wheel to check its bearing free play. If the bearing is noisy or its free play is too much, replace it.

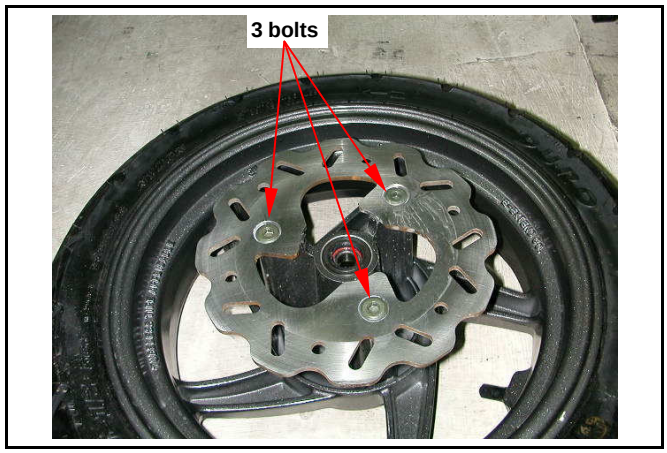


Place the wheel on to a rotation seat to check its rim wobbling. Turn the wheel with hand and measure its rim wobbling value with a dial gauge.
Service limit:
Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)



Bearings replacement

Remove 3 bolts and brake disc.



Remove left side dust seal, bearing and dist. collar.

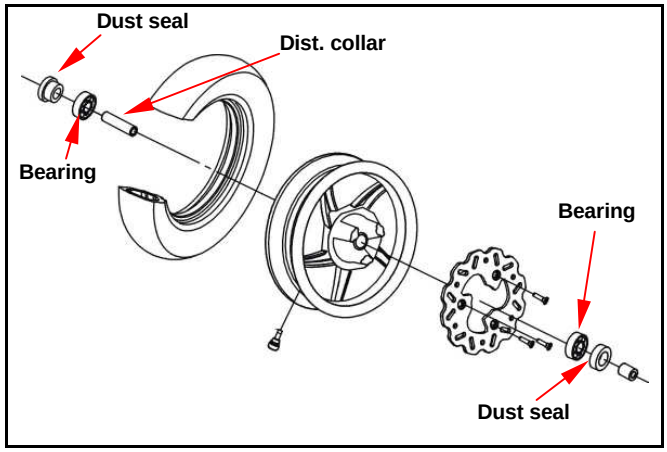
Special tools
Inner bearing puller (SYM-6204020)

Installation

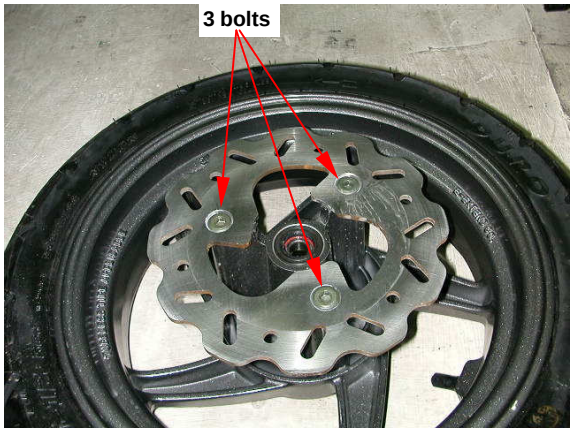
Fill out the block of bearing by grease.
Drive the left bearing, dust seal into wheel rim and install the dist. collar.
Install the right bearing and dust seal.

⚠ Caution

- Carefully install the bearing in correct and evenly.
- Bearing outer face should be faced up as bearing installation.



Install the brake disc and then tighten the bolts **(disc brake).**
Torque value: 4.0~4.5kgf-m

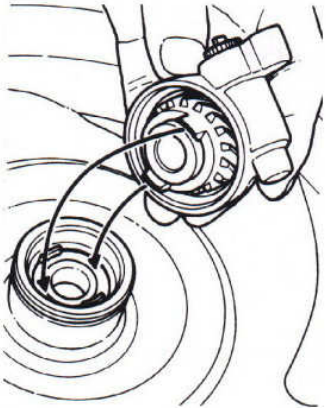


Lubricate the speedometer gear with grease and install the gear into the wheel hub.
Align the flange part on the speedometer gear with the slot of wheel hub.

⚠ Caution

Contaminated brake lining will reduce brake performance so the brake lining, brake drum and disc must be free of grease.

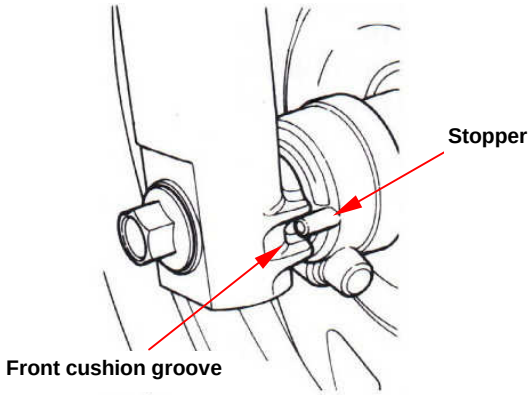
Apply with grease onto the left side dust seal.
Install the left side collar.



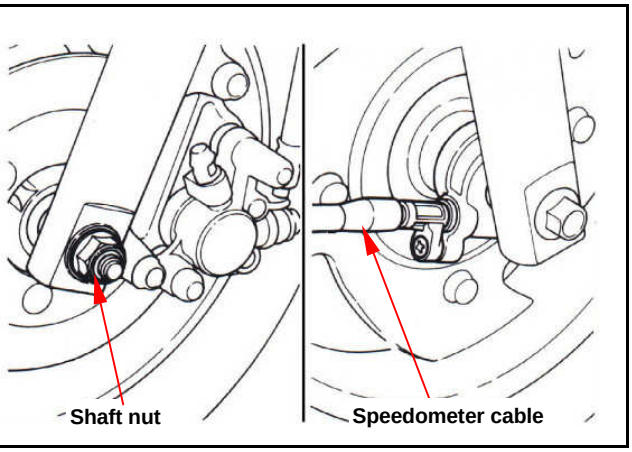
Place the front wheel between the front cushions.

⚠ Caution

Align the front cushion groove with the speedometer gear box stopper flange.



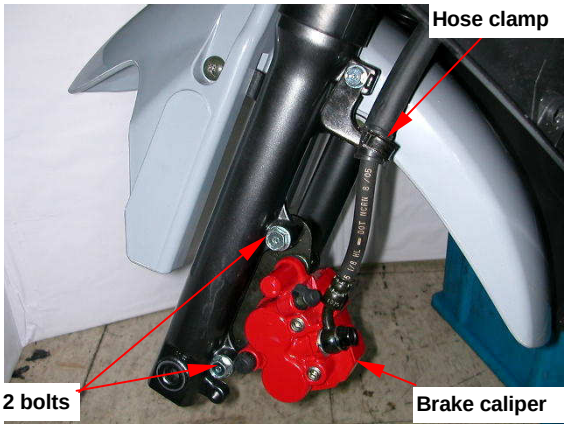
Insert the wheel axle into the wheel, and then install the wheel axle nut.
Tighten the nut to specified torque.
Torque value: 5.0~7.0kgf-m
Connect the speedometer cable to the speedometer gear box.



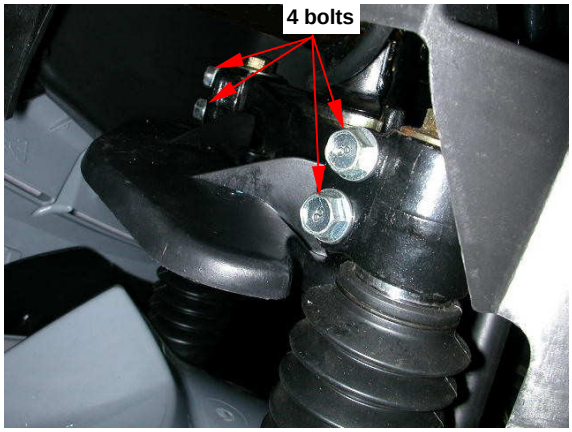
Front Cushion

Removal

Remove front cover, front fender and front wheel.
Remove the caliper mounting bolt and the caliper.
Take out the hose from hose clamp.



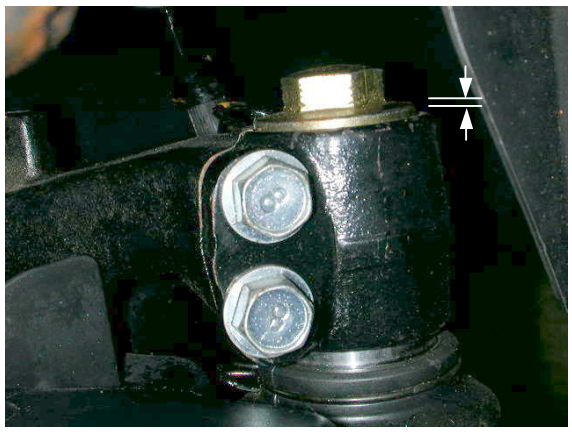
Remove the front cushion upper bolts and the front cushion.



Installation

Align the cover flange with upper level of the cushion clamp, and then tighten bolts.
Torque value: 2.4~3.0kgf-m

Install the removed components in reverse order of removal procedures.



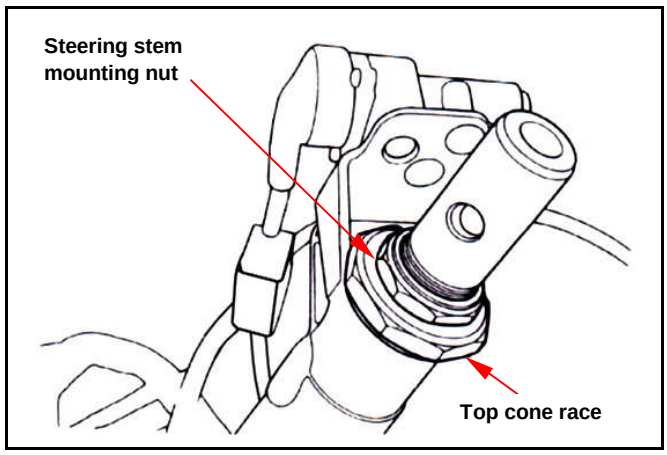
Steering Stem

Removal

Remove steering handle, front wheel and front cushion.
Remove the steering stem mounting nut.
Remove top cone race and front fork.

⚠ Caution

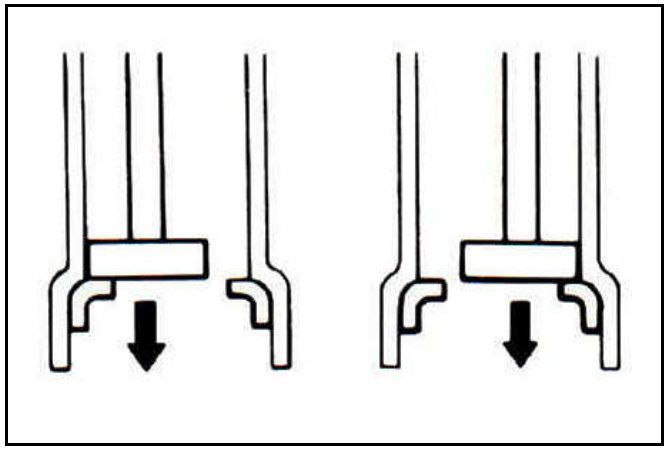
Place the steel ball onto a parts container to prevent from missing.



Slightly tap the top and bottom ball bearing seats with a plastic hammer to remove the seats.
Remove bottom cone race body with a punch.

⚠ Caution

Do not damage the steering stem.



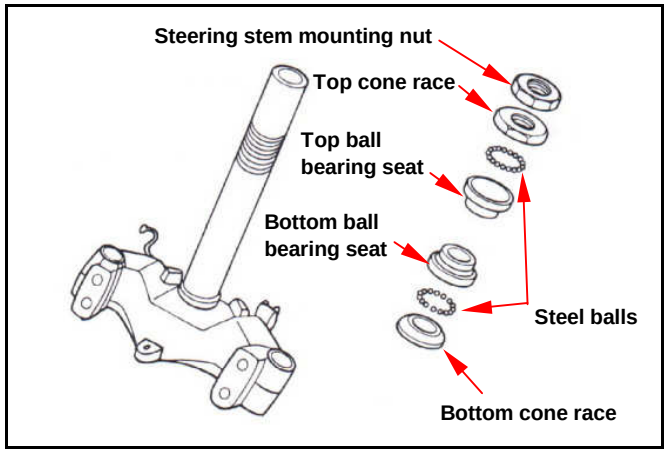
Installation

Install a new bottom cone race onto the steering stem.
Push the cone race until to mounted position.

⚠ Caution

Do not tilt the ball bearing seats as installation.

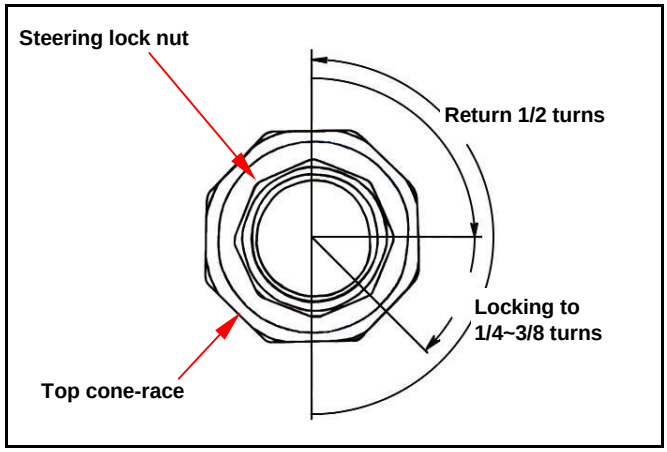
Apply with grease onto the ball bearing seats, and install steel balls onto the seats.
(Top: 26 balls, bottom: 29 balls)



Lubricate the top cone race seat with grease.
Screw the cone race in to top ball bearing seat till touching, and then screw out the cane race 1/4~3/8 turns.
Torque value: 0.2~0.3kgf-m

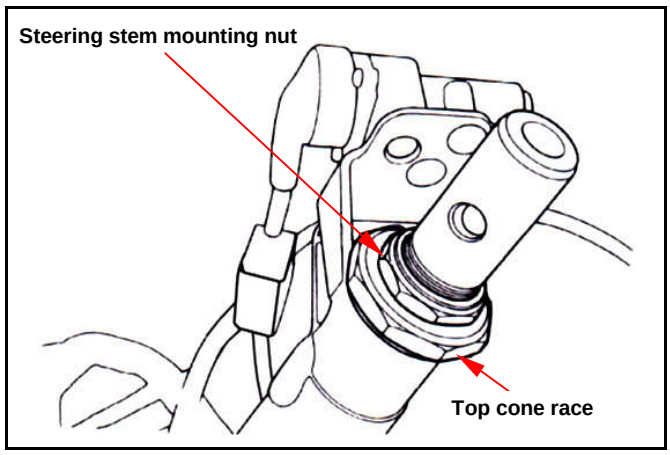
⚠ Caution

Check the steering stem that should be rotated freely and no clearance in vertical direction.

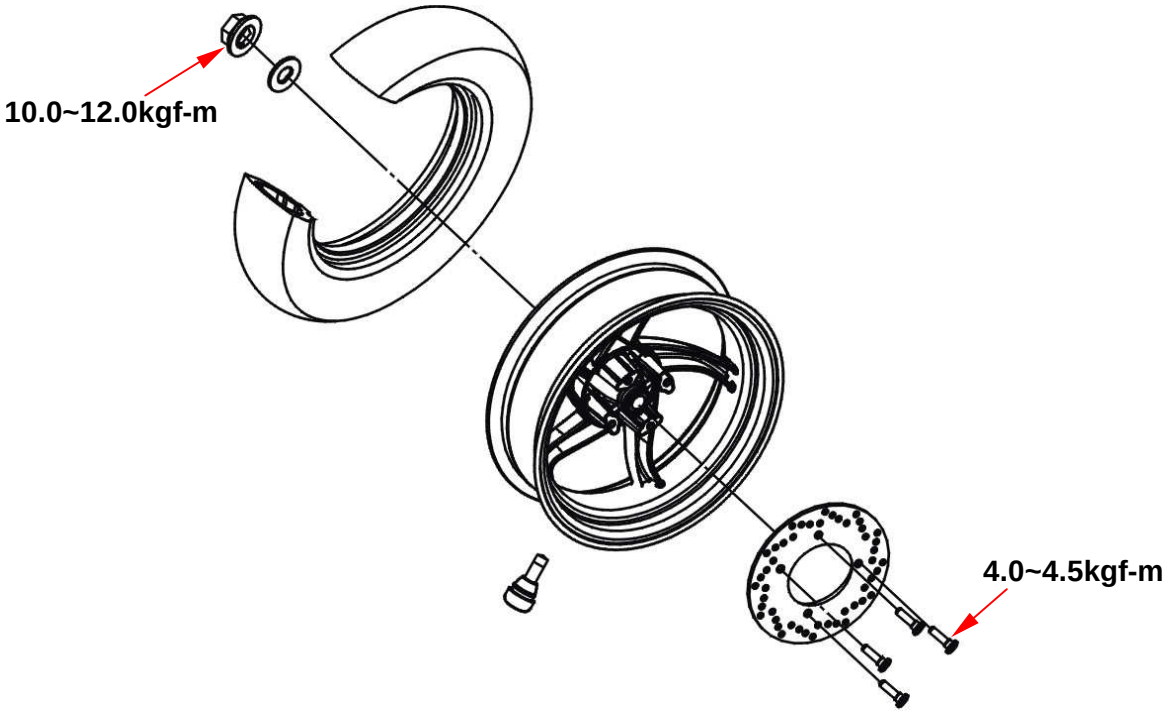


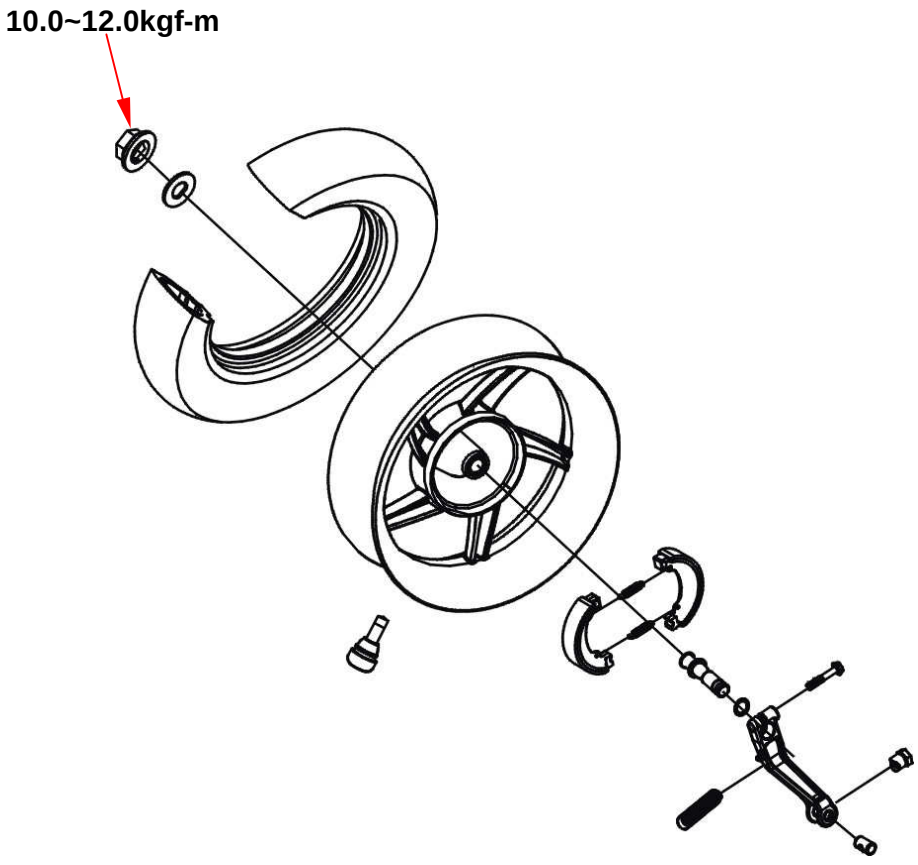
Install the steering stem mounting nut and tighten the nut by means of holding the top cone race body.
Torque value: 1.0~1.2kgf-m

Install in reverse order of removal procedures.



Maintenance Information ····· 14-2	Rear Wheel ····· 14-3
Troubleshooting ····· 4-21	Rear Cushion ····· 14-5





14. Rear Wheel / Rear Cushion

Maintenance Information

Specification

Item	Standard value (mm)	Limit (mm)
Rear wheel rim run out	—	2.0 (0.08 in)

Torque Value

Rear cushion upper mounting bolt	3.5~4.5kgf-m
Rear cushion lower mounting bolt	2.4~3.0kgf-m
Rear wheel nut	10.0~12.0kgf-m
Bolts for the brake disc	4.0~4.5kgf-m
Exhaust muffler nut	1.0~1.4kgf-m
Exhaust muffler bolt	3.0~3.6kgf-m

Troubleshooting

Rear wheel wobbling

1. Bend wheel rim
2. Poor tire
3. Loosen wheel shaft

Cushion too soft

1. Insufficient cushion spring force

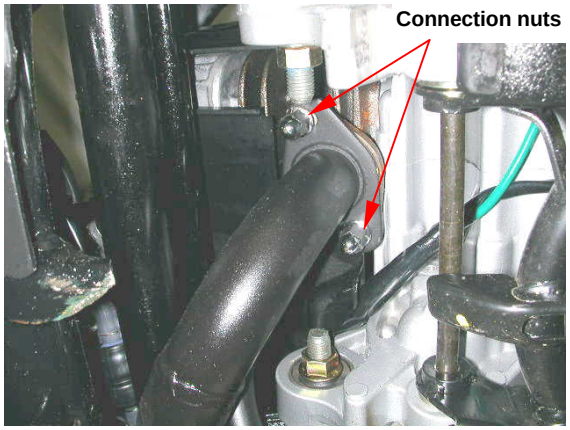
Poor brake performance

1. Poor brake adjustment
2. Contaminated brake lining
3. Worn brake lining cam
4. Worn brake cam lever
5. Worn brake drum
6. Improper installation of brake arm gear set.

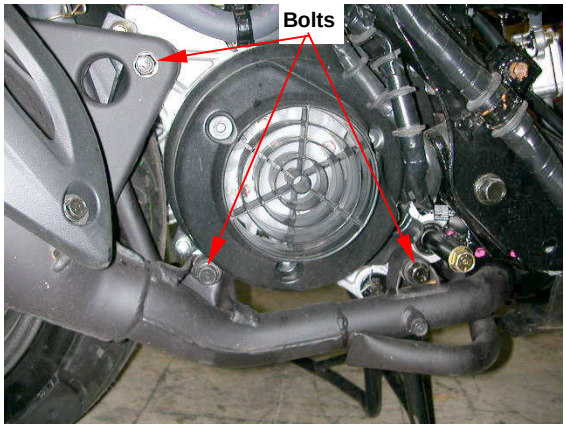
Rear Wheel

Remove

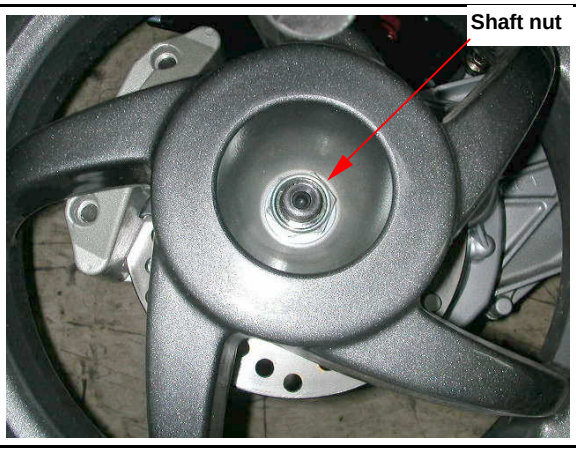
Remove exhaust pipe nut. (2 connection nuts)



Remove exhaust muffler bolt (3 bolts), then remove the muffler.



Remove rear wheel shaft nut and then remove the rear wheel.



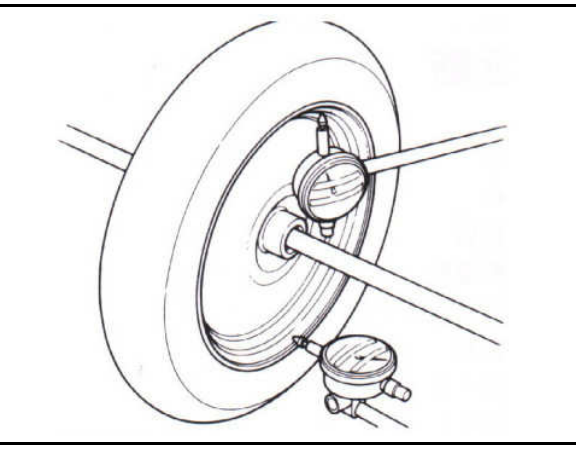
Inspection

As the diagram shown, measure wheel rim wobbling with a dial gauge.

Service limit:

Radial: 2.0 mm (0.08 in)

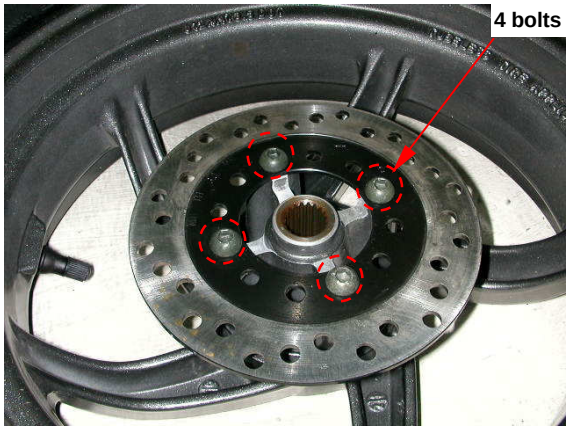
Axial: 2.0 mm (0.08 in)



14. Rear Wheel / Rear Cushion

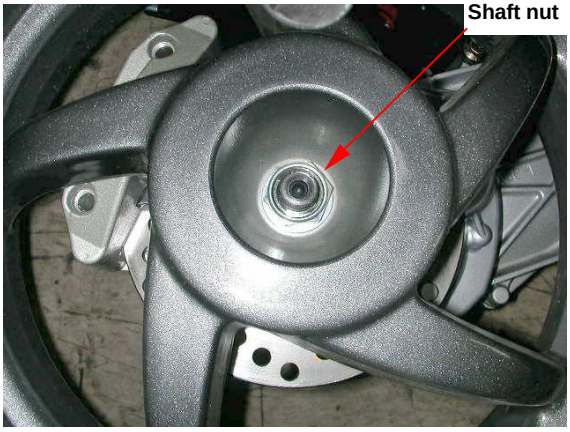
Brake disc removal / install

Remove 4 bolts, and then remove brake disc.
Check item refer chapter 12.
Install by reverse order of removal procedures.

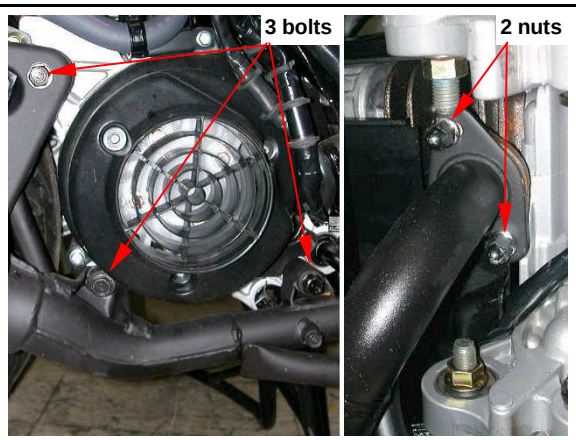


Installation

Install the rear wheel and tighten the nut.
Tighten torque: 10.0~12.0kgf-m



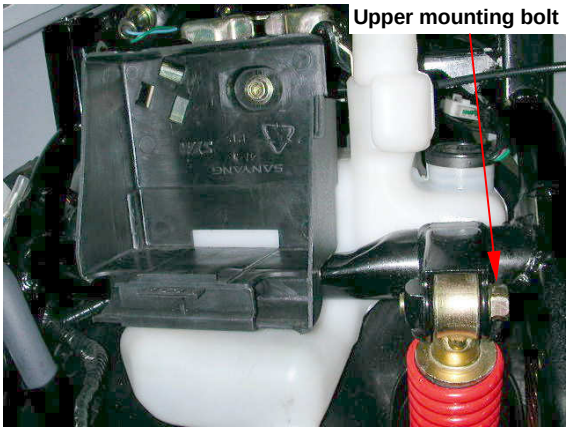
Install exhaust pipe & muffler.
Tighten torque (bolt): 3.0~3.6kgf-m
Tighten torque (nut): 1.0~1.4kgf-m



Rear Cushion

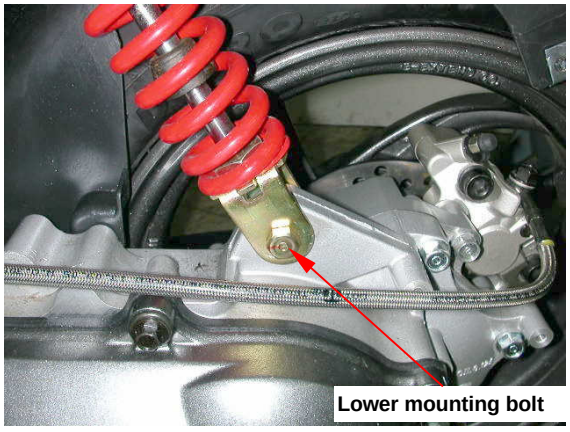
Removal

Remove luggage box.
Remove air cleaner.
Remove rear cushion upper & lower bolts.
Remove rear cushion.



Installation

Install the rear cushion.
Tighten the upper & lower mounting bolts to specified torque.
Torque value:
Upper mounting bolt: 3.5~4.5kgf-m
Lower mounting bolt: 2.4~3.0kgf-m
Press down the tail of the scooter for several times to check cushion operation.
Install all components in reverse order of removal procedures.



Note:

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Battery ····· 15-4
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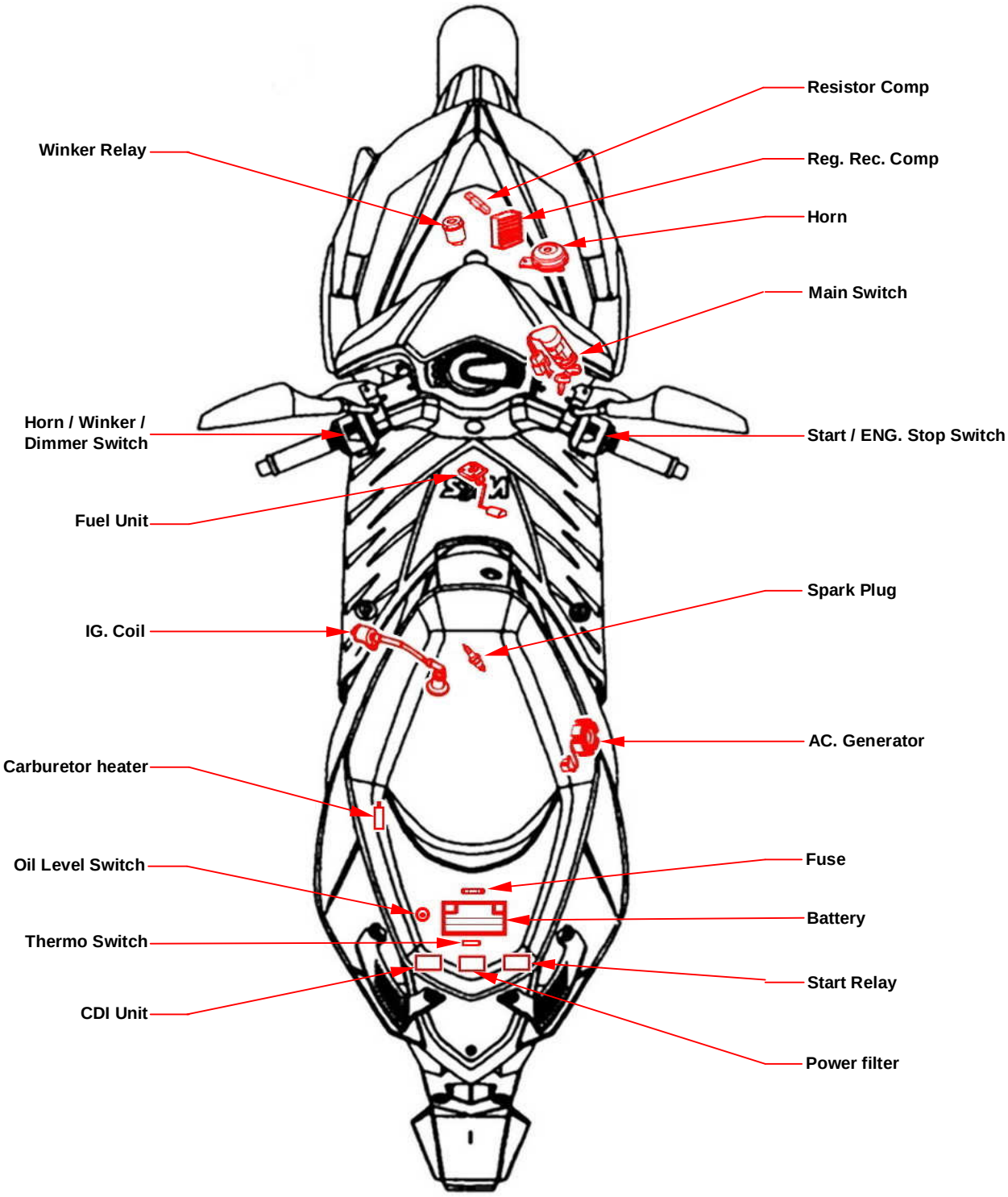


Maintenance Information

Precautions in Operation

- When remove the battery, the disconnection sequence of cable terminals shall be strictly observed. (First disconnect the negative cable terminal, next, the positive cable terminal.)
- The model of the spark plug and the tightening torque.
- The ignition timing.
- Adjustment of headlight.
- Removal and installation of AC generator.
- The maintenance-free battery requires no inspection of electrolyte level and refilling of distilled water.
- To recharge the battery, remove the battery from the motorcycle without removing ventilation caps.
- Unless in emergency, never rapid charge the battery.
- The voltage must be checked with the voltmeter while charging the battery.
- As C.D.I assembly does not require an ignition timing check. In case ignition timing is incorrect, check C.D.I and AC generator. Verify with an ignition timing light after replacement if necessary.
- The starter motor can be removed after the engine is removed.

Specification

Charging System

Item		Specification
Battery	Type	TTZ 7SL
	Capacity	12V6Ah
	Charging rate	0.7A / 5~10 hours (standard), 3A / 1 hour (fast charging)
Leak current		< 1 mA
Charging current		1.2 A / 5000 rpm ↑
Control voltage in charging		14.0~15.0 V / 5000 rpm

Ignition System

Item		Specification
Spark plug	Model	NGK BR8HSA (Recommended)
	Gap	0.6~0.7 mm
Ignition coil and resistance	Primary coil	0.19~0.23 Ω
	Secondary coil	2.8~3.4 KΩ
Ignition timing “F” mark		17° BTDC / 1800 rpm

Troubleshooting

No voltage

- Battery discharged
- The cable disconnected
- The fuse is blown
- Improper operation of the main switch

Low voltage

- The battery is not fully charged
- Poor contact
- Poor charging system
- Poor regulator rectifier

No spark produced by spark plug

- The spark plug is out of work
- The cable is poorly connected, open or short-circuited
  - Between AC.G. and C.D.I.
- Poor connection between C.D.I. and ignition coil
  - Poor connection between C.D.I. and the main switch
- Poor main switch
- Poor C.D.I.
- AC.G. is out of work

Starter motor does not work

- The fuse is blown
- The battery is not fully charge
- Poor main switch
- Poor starter switch
- The front and rear brake switches do not operate correctly
- Starter relay is out of work
- The ignition coil is poorly connected, open or short-circuited
- The starter motor is out of work

Intermittent power supply

- The coupler of the charging system becomes loose
- Poor connection of the battery cable
- Poor connection or short-circuit of the discharging system
- Poor connection or short-circuit of the power generation system

Charging system does not operate properly

- Burnt fuse
- Poor contact, open or short circuit
- Poor regulator
- Poor AC.G.

Engine does not crank smoothly

- Primary coil circuit
  - Poor ignition coil
  - Poor connection of cable and couplers
  - Poor main switch
- Secondary coil circuit
  - Poor ignition coil
  - Poor spark plug
  - Poor ignition coil cable
  - Current leakage in the spark plug cap
- Incorrect ignition timing
  - Poor AC.G.
  - Improper installation of the pulse sensor
  - Poor C.D.I.

Weak starter motor

- Poor charging system
- The battery is not fully charged
- Poor connection in the windings
- The motor gear is jammed by foreign material

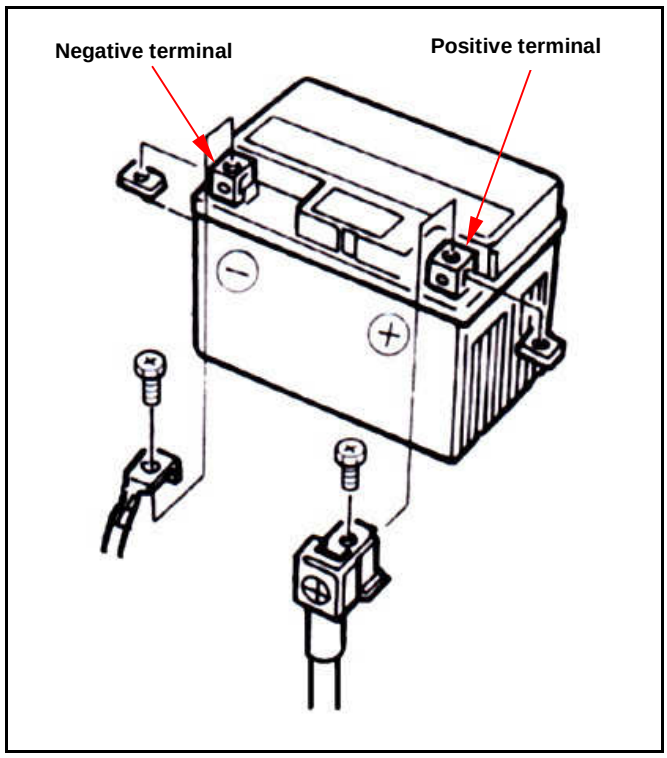
Starter motor is working, but engine does not crank

- Poor starter motor pinion
- The starter motor run in reverse direction
- Poor battery

Battery

Battery Removal/Installation

Turn off main switch.
Open seat, remove 2 screws and then open battery cover.
Disconnect the negative cable terminal first, then the positive cable terminal.
Remove the battery from the scooter.
Install the battery in reverse order of removal.



Voltage Check

Open seat and battery cover.
Remove wires from battery.
Check battery voltage.
Voltage:
Fully charged: 13.0~13.2V
Undercharged: 12 V

Charging

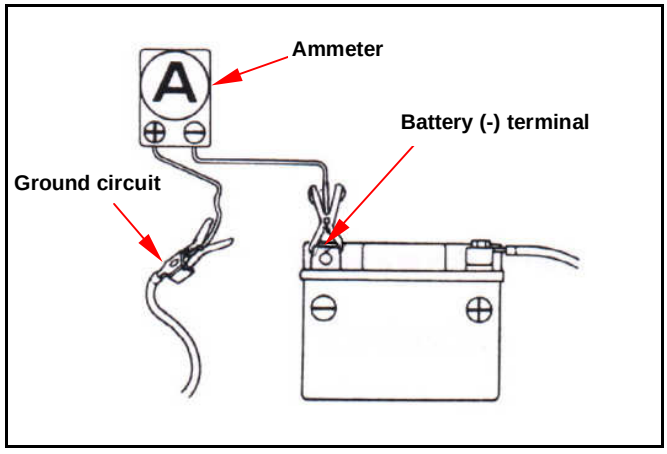
Remove the battery.
Connect the positive terminal (+) of the charger to the battery positive terminal (+).
Connect the negative terminal (-) of the charger to the battery negative terminal (-).
Standard charging current/time: 0.7A/5~10 hrs.
Fast charging current/hrs: 3A/1 hr.

⚠ Caution

- Strictly keep flames and sparks away while recharging to avoid to explosion causing by hydrogen.
- Stop charging battery when electrolyte temperature is over 45℃(117℉).
- Fast charging the battery is for in emergency only. Battery should be charged in standard.

Current Leakage Inspection

Turn the main switch to OFF position, and remove the negative cable terminal (-) from the battery.
Connect an ammeter between the negative cable terminal and the battery negative terminal.

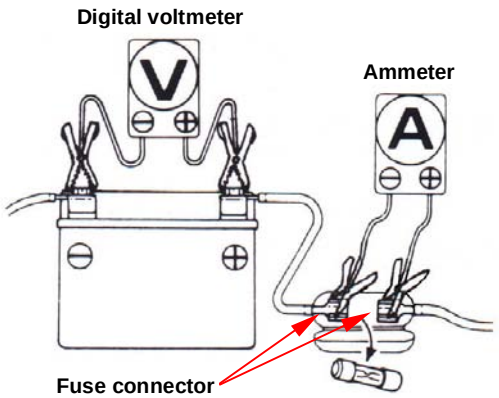


⚠ Caution

- In the current leakage test, set the current range at larger scale, then gradually decrease to the lower scale as the test process goes to avoid possible damage to the ammeter and the fuse.
- Do not turn the main switch to ON position during test.

If the leaked current exceeds the specified value, it may indicate a short circuit.
Allowable current leakage: Less than 1 mA
Disconnect each cable one by one and take measurement of the current of each cable to locate the short circuit.

Charging Voltage Inspection



⚠ Caution

- Before conducting the inspection, be sure that the battery is fully charged. If undercharged, the current changes dramatically.
- Use a fully charged battery having a voltage larger than 13.0 V
- While starting the engine, the starter motor draws large amount of current from the battery.

After the engine is warmed up, replace original battery with a fully charged battery. Connect a digital voltmeter to the battery terminals.
Connect an ammeter between both ends of the main fuse.

⚠ Caution

When the probe is reversibly connected, use an ammeter having an indication that shows both positive and negative direction current. The measurement would be at zero, if the ammeter is one direction only.

⚠ Caution

- Do not use short-circuit cable.
- It is possible to measure the current by connecting an ammeter between the battery positive terminal and the + cable position terminal, however, while the starter motor is activated, the surge current of the motor draws from the battery may damage the ammeter. Use the kick-starter to start the engine.
- The main switch shall be turned to OFF position during the process of inspection. Never tamper with the ammeter and the cable while there is current flowing through. It may damage the ammeter.

Connect a tachometer.
Turn on the headlight to high beam and start the engine.
Accelerate the engine to the specified revolution per minute and measure the charging voltage.
Specified Charging Current: 1.2 A / 5000 rpm
Control Charging Voltage: 14.0~15.0 V / 5000 rpm

⚠ Caution

To replace the old battery, use a new battery with the same current and voltage.

The following problems are related to the charging system; follow the instructions provided in the checking list to correct it if any one of the problems takes place.

(1) The charging voltage cannot exceed the voltage between two battery terminals and the charging current is in the discharging direction.
(2) The charging voltage and current are too much higher than the standard values.

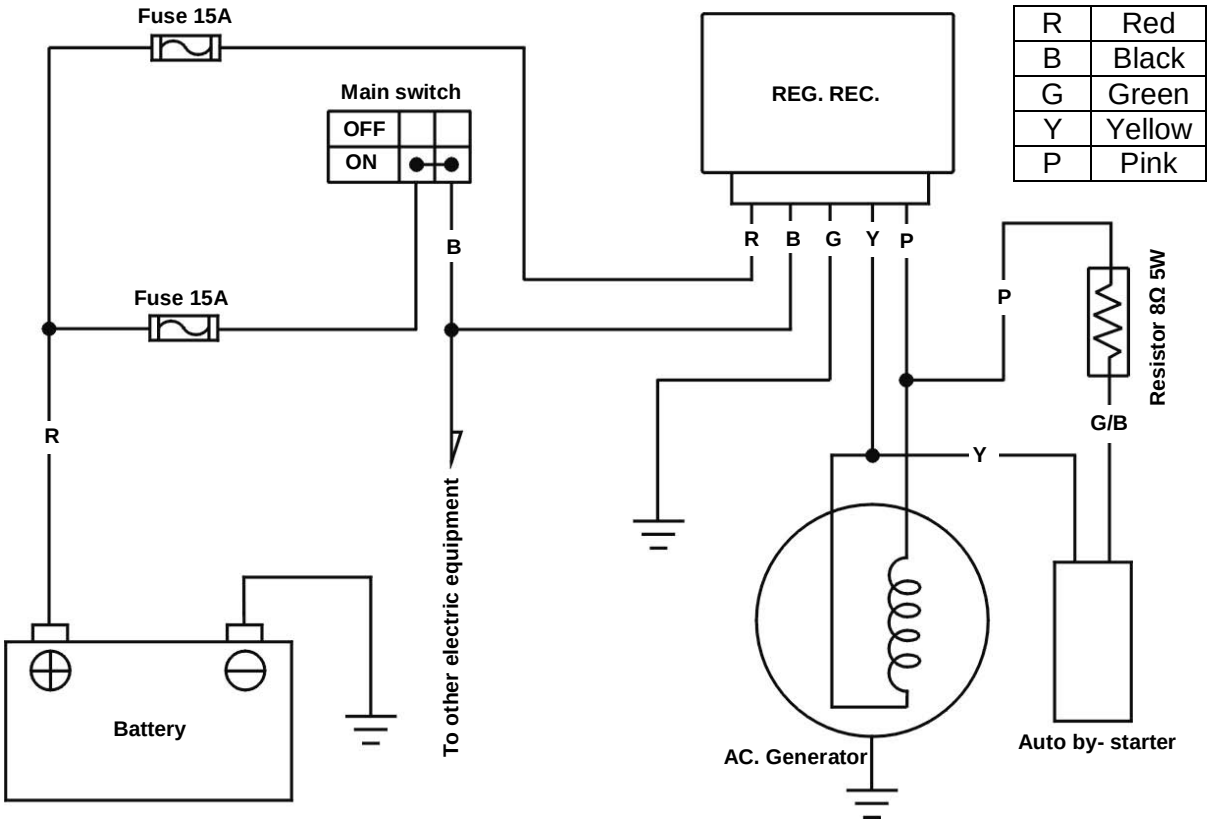
The following problems are not related to the charging system; correct it if any by following steps indicate in the checking list.

(1) The standard charging voltage and current can only reach when the revolution of the engine exceeds the specified rpm.
   - Bulbs used exceed their rate and consume too much power.
   - The replacement battery is aged and does not have enough capacity.

(2) The charging voltage is normal, but the current is not.
   - The replacement battery is aged and does not have enough capacity.
   - Battery used does not have enough electricity or is over charged.
   - The fuse of the ammeter is blown.
   - The ammeter is improperly connected.

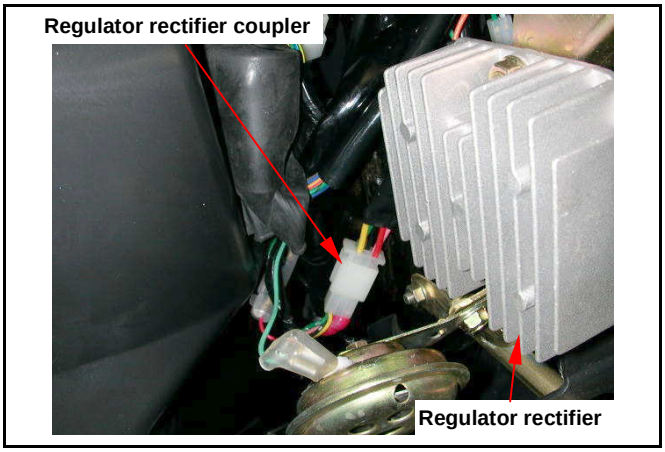
(3) The charging current is normal, but the voltage is not.
   - The fuse of the voltmeter is blown.

Charging System



Regulator rectifier Inspection

Check the each pins of coupler on the regulator rectifier.



Inspection	Probable cause
Check voltage between battery terminal (red) and ground (green).	Blown fuse.
Check voltage between main switch terminal (black) and ground (green).	Blown fuse or poor main switch contact (main switch ON)
Check continuity between ground (green) and frame.	Open-circuit wire.
Check charging coil (yellow to pink) if its resistance is within 0.2~1.0Ω	Open-circuit in alternator charging coil.

If wire circuit check is in normal and there is no loose in the pins of regulator rectifier coupler, then measure the resistance among pins on the couplers of regulator rectifier.

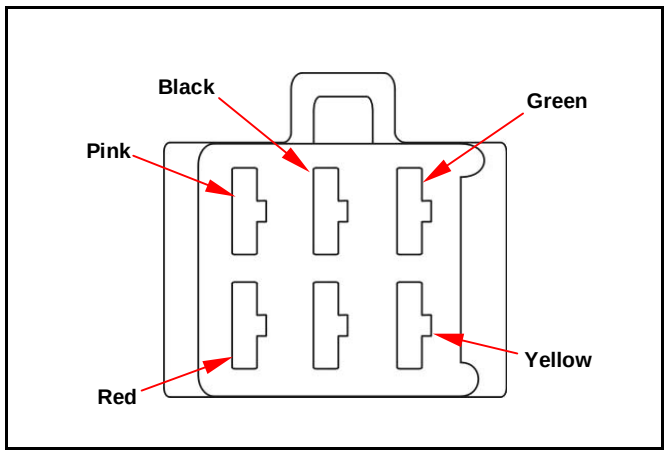
Regulator rectifier Inspection

+ / -	R	B	G	P	Y
R		∞	∞	∞	∞
B	2.8MΩ		522.1Ω	1.5MΩ	1.7MΩ
G	2.7MΩ	522.1Ω		1.5MΩ	1.7MΩ
P	1.5MΩ	29.2MΩ	29.2MΩ		30MΩ
Y	1.6MΩ	26.3MΩ	26.3MΩ	2.7MΩ	

If the resistance values are abnormal among the pins, replace the regulator rectifier.

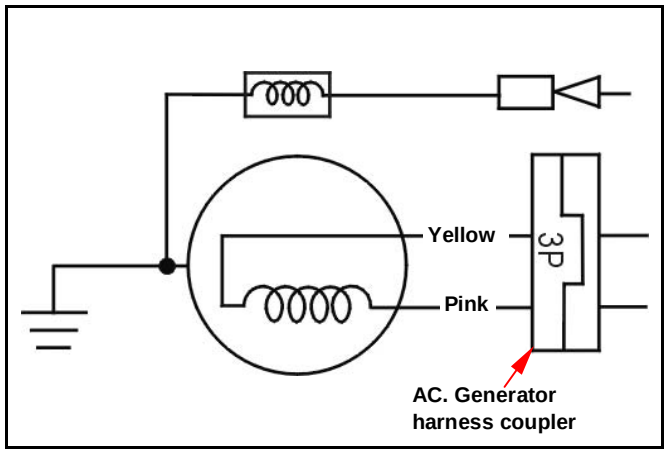
⚠ Caution

- If the probe is touched by finger, then the resistance values will be incorrect.
- It contains semi-conductor in circuit so the measured resistance value will be in different if different testers are used. Thus, these values cannot be judged with standards.

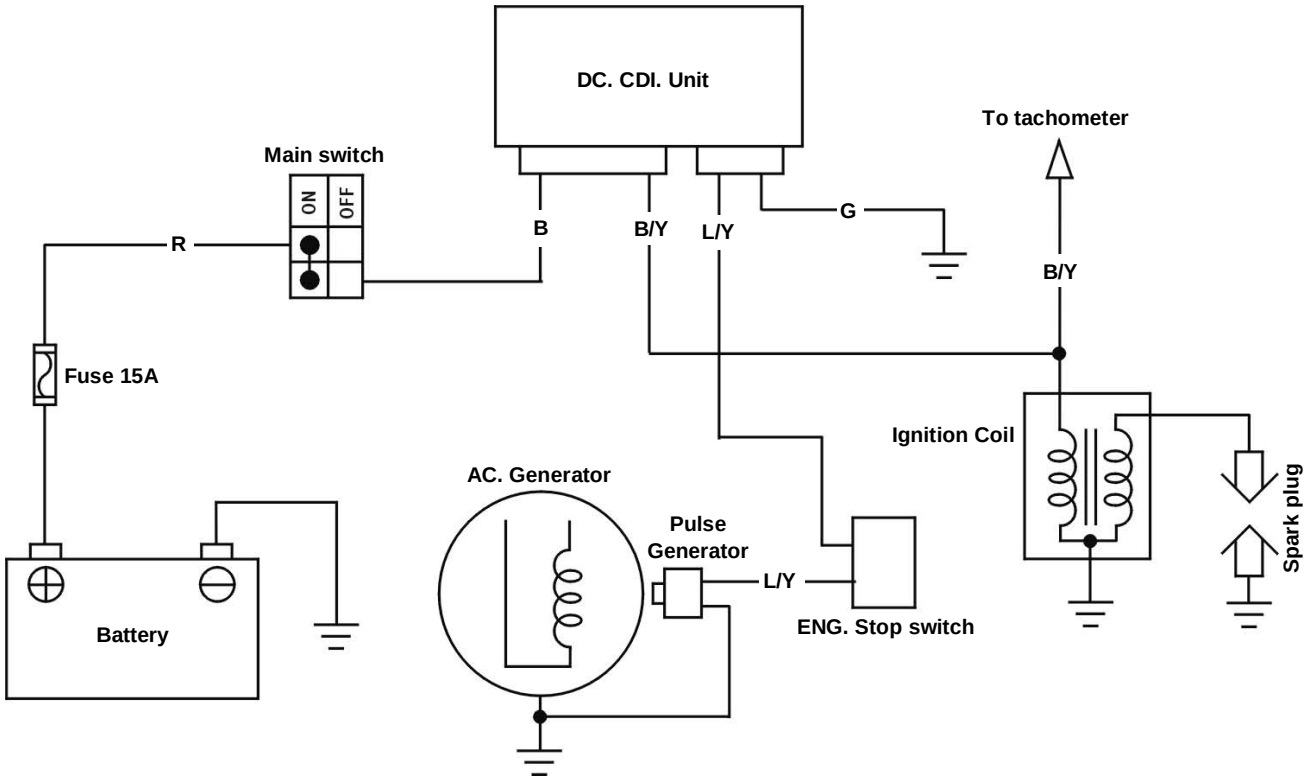


AC Generator Inspection

Remove luggage box.
Disconnect the generator harness coupler.
Measure the resistance on charging coil (the yellow to pink).
Resistance Measurement: (20℃)
Charging coil (yellow ~ pink): 0.2~1.0Ω

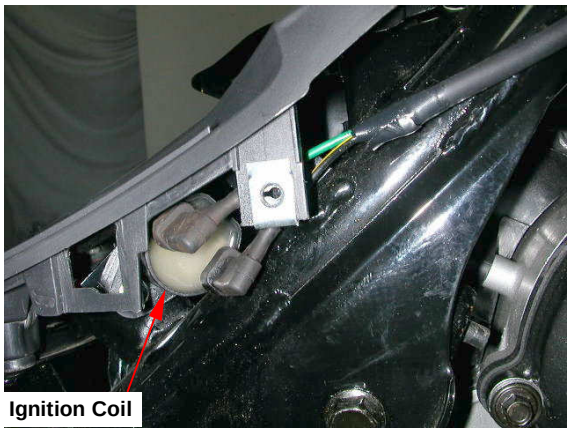


Ignition System

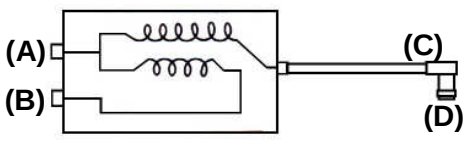


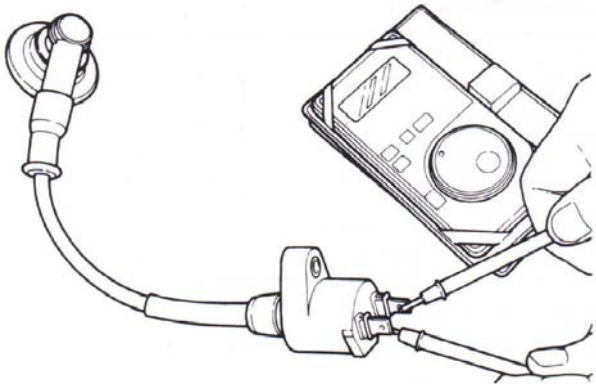
Ignition Coil Inspection

Remove lower side cover.
Remove ignition coil wire pins.



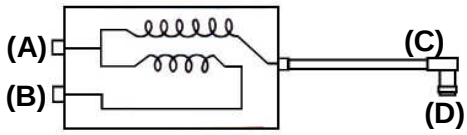
Measure the primary coil resistance.
Resistance :0.19~0.23Ω (A)→(B)
Measure the secondary coil resistance.
Resistance : 8.2~9.3KΩ (A)→(D)

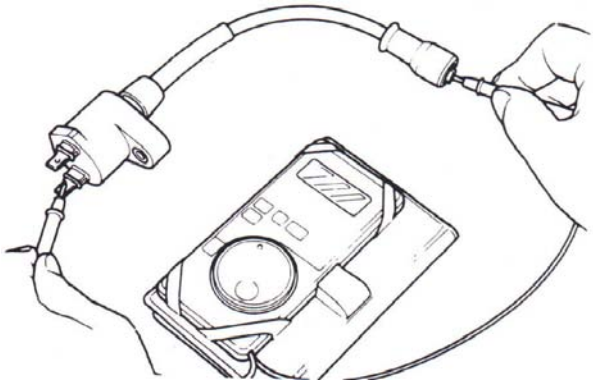




Remove the plug cap, and measure its negative (-) terminal for the secondary coil resistance.

Resistance : 3.1~3.2KΩ(A)→(C)





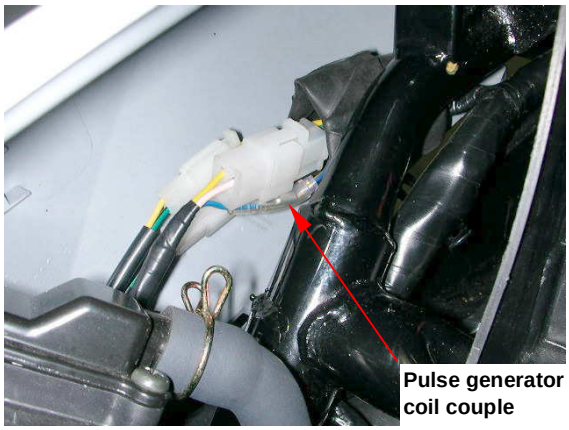
Electrical System Circuit Inspection

Pulse Generator

Remove luggage box.
Disconnect pulse generator coil coupler.

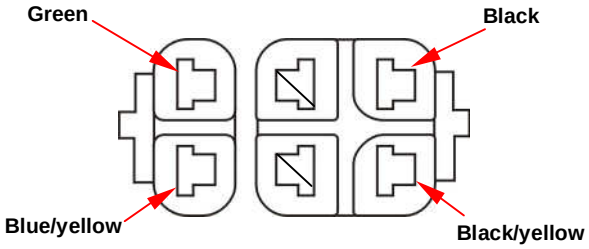
Resistance Measurement: (20℃)

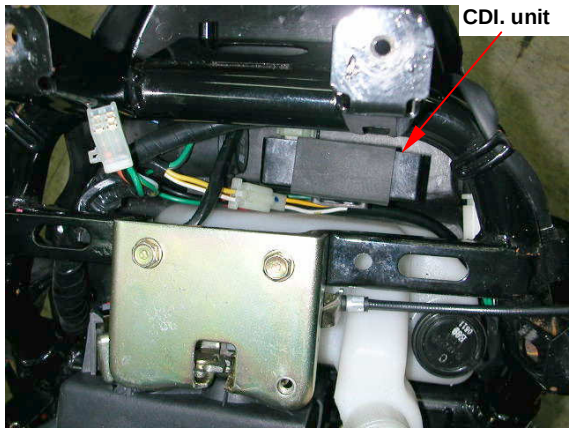
Pulse generator coil (blue/yellow ~ ground): 50~200Ω



CDI Electrical System Circuit Inspection

Remove luggage box and body cover.
Disconnect the CDI. unit coupler, and check its circuit to diagnosis related ignition components.

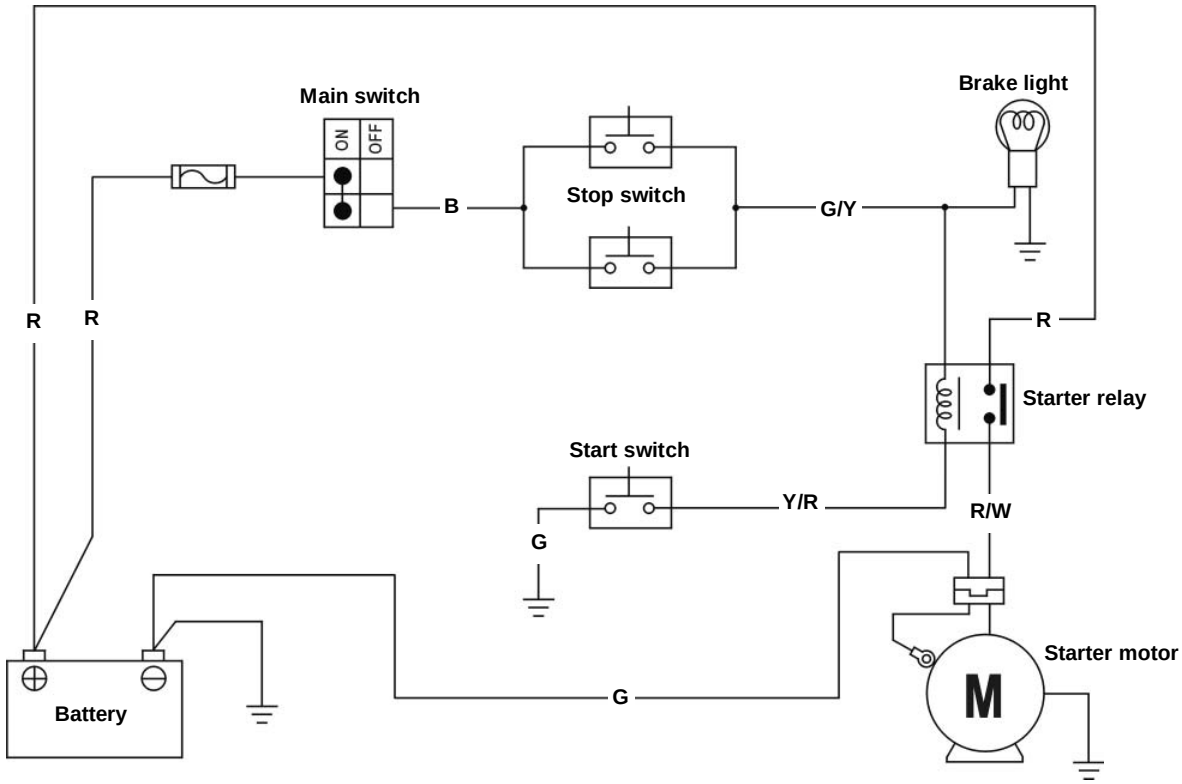




Item		Measure at:	Standard (at 20℃)
Main Switch		Black ~Green	Continuity (battery voltage) as main switch ON
Pulse Generator		Blue/Yellow ~ Green	50 ~200Ω
Ignition Coil	Primary	Black/yellow ~ Green	0.19~0.23Ω
	Secondary	Green ~ high voltage cable ~w/o Cap	3~5KΩ
		Green ~ high voltage cable ~ w/ Cap	8.2~9.3KΩ

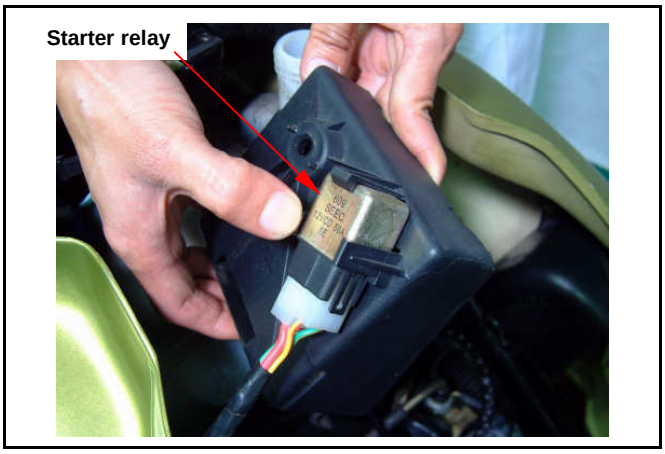
- If above checks are in normal but spark plug is still no spark. Then it probable causes from CDI set or high voltage coil.
- If abnormal circuits are found in above checks, at first check all items, and then check each item one by one.

Starting System

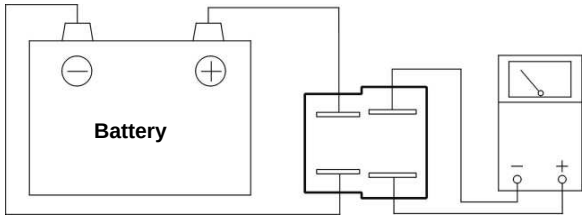


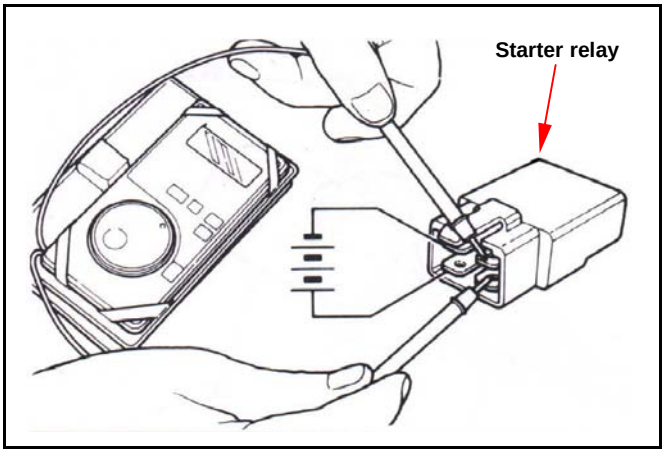
Starter Relay Inspection

Remove battery box and then remove starter relay.



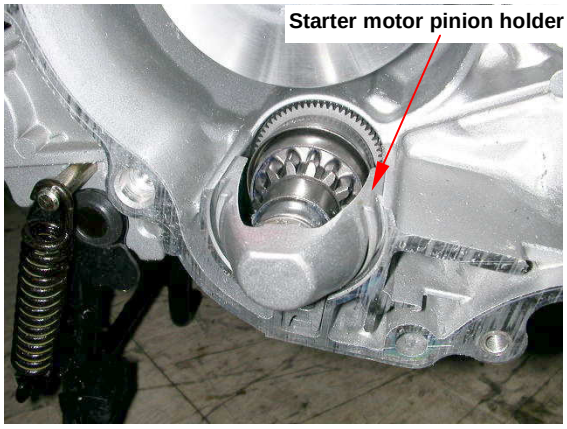
Connect both the green/yellow (-) and the yellow/red (+) pins to battery posts directly.
If the red and red/white pins are also in continuity, it means it is in normal.





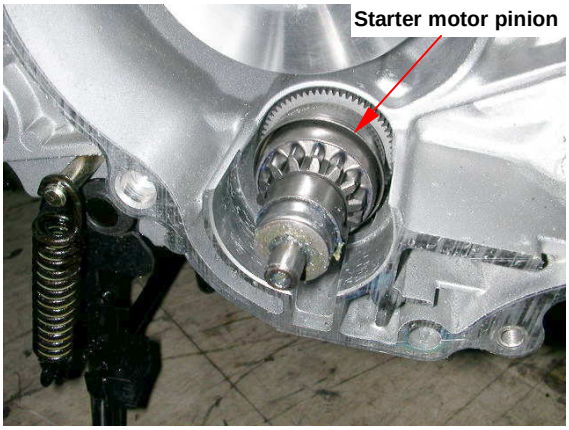
Starter Motor Pinion Removal/Installation

Remove left crankcase cover and drive face.
Remove starter motor pinion holder, and then remove starter motor pinion.
Install the starter motor pinion in reverse order of removal.



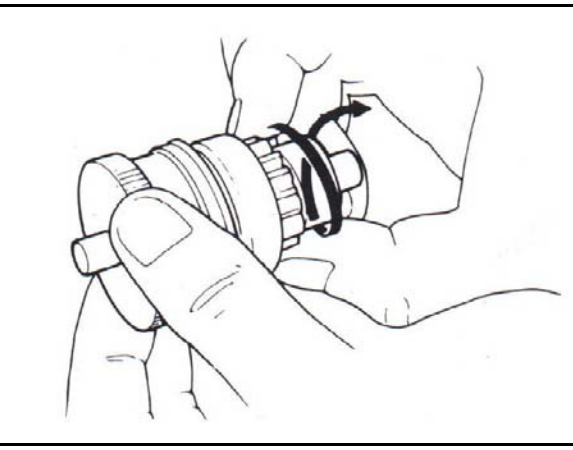
Starter Motor Pinion Inspection

- Pinion, reduction gear for wear out or damage → replace it with new one.
- Gear journal for wear out or damage → replace it with new one.



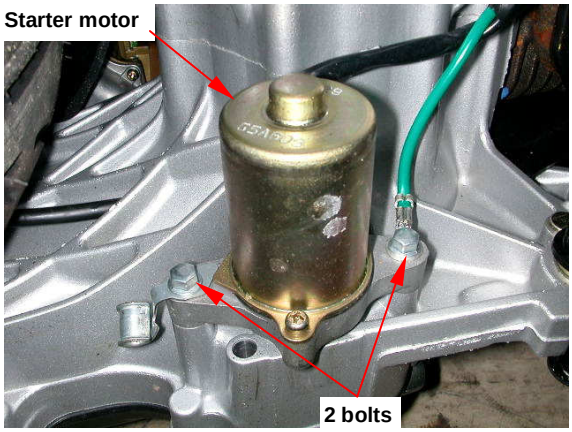
Check the pinion for sliding in axial direction smoothly.

- The pinion sliding in axial direction not in smooth → replace it with new one.



Starter Motor Removal/Disassembly

Remove body cover.
Remove bolt and oil pump control cable.
Disconnect starter motor harness coupler.
Remove 2 bolts for separation starter motor and gasket.
Remove 2 bolts for disassembly the starter motor.



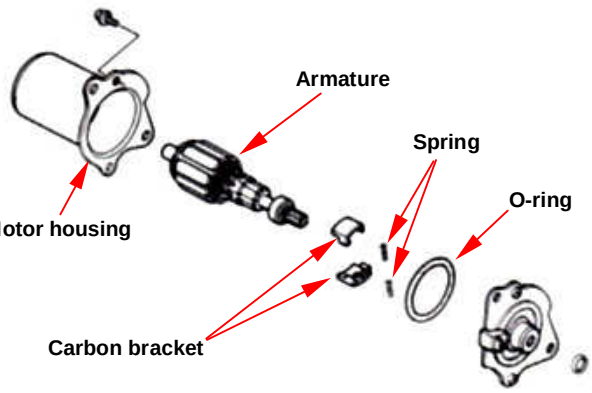
Armature Inspection

Check the armature for discoloration or other damage. It may be short-circuiting if dark surface on the shifter found.

⚠ Caution

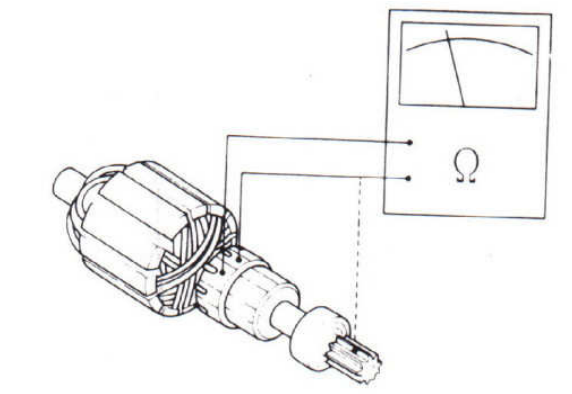
Do not clean the shifter surface with sandpaper.

Check continuity 1) both the shifter surface and shaft, 2) among the shifter surfaces. It can be in continuity among the shifter surfaces, but both the shifter surface and the shaft cannot be in continuity.



Starter Motor Re-Assembly/Installation

Re-assemble and install the starter motor in reverse order of removal procedures.



Oil Level Switch

Troubleshooting

- If the oil level in oil tank is in specified level, but the oil level indicator still goes on.
  1.Remove luggage box.
  2.Disconnect oil level switch wire, and turn the main switch to ON position.

Indicator light up	Indicator not light up
↓	↓
Short-circuit between indicator and oil level switch.	Malfunction of oil level switch.

- If there is no oil in oil tank or low oil level, but the oil level indicator still not goes on.
  3. Remove body cover.
  4. Disconnect oil level switch wire and connect a jump wire among coupler, and then turn the main switch to ON position.

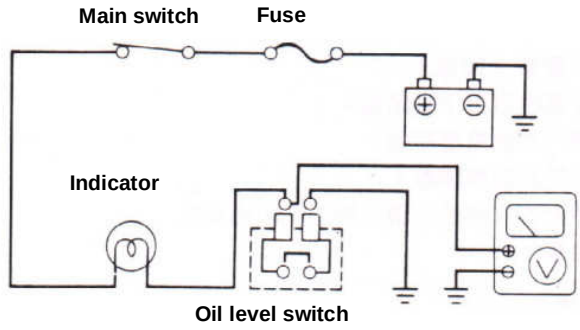
Indicator not light up	Indicator light up
↓	↓
Poor wire connection.	Malfunction of oil level switch.

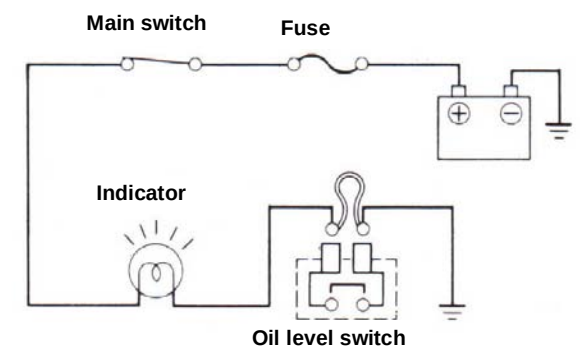
5. Disconnect oil level switch coupler, and check voltage between wire and ground.

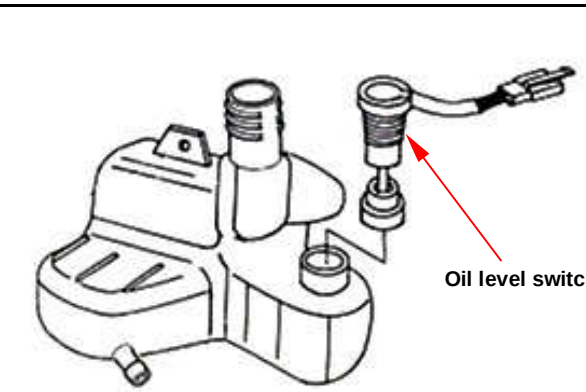
No voltage	Voltage
↓	↓
• Open-circuit between oil level switch and indicator. • Blown bulb.	• Malfunction of oil level switch. • Poor connection of oil level switch.

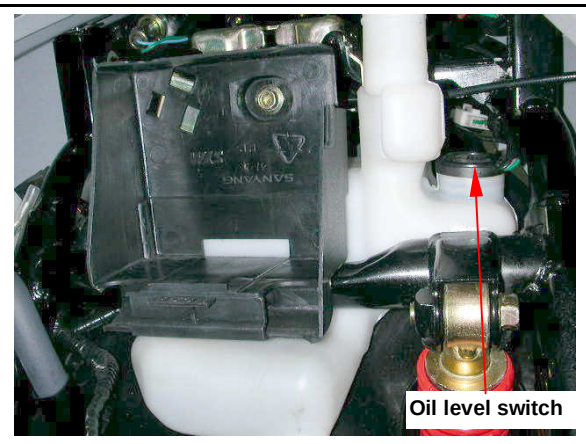
Removal/Installation

Remove luggage box.
Drain out oil from oil outlet tube.
Pull up oil level switch, and then remove oil level switch from the oil tank.
Install the oil level switch in reverse order of removal procedures.

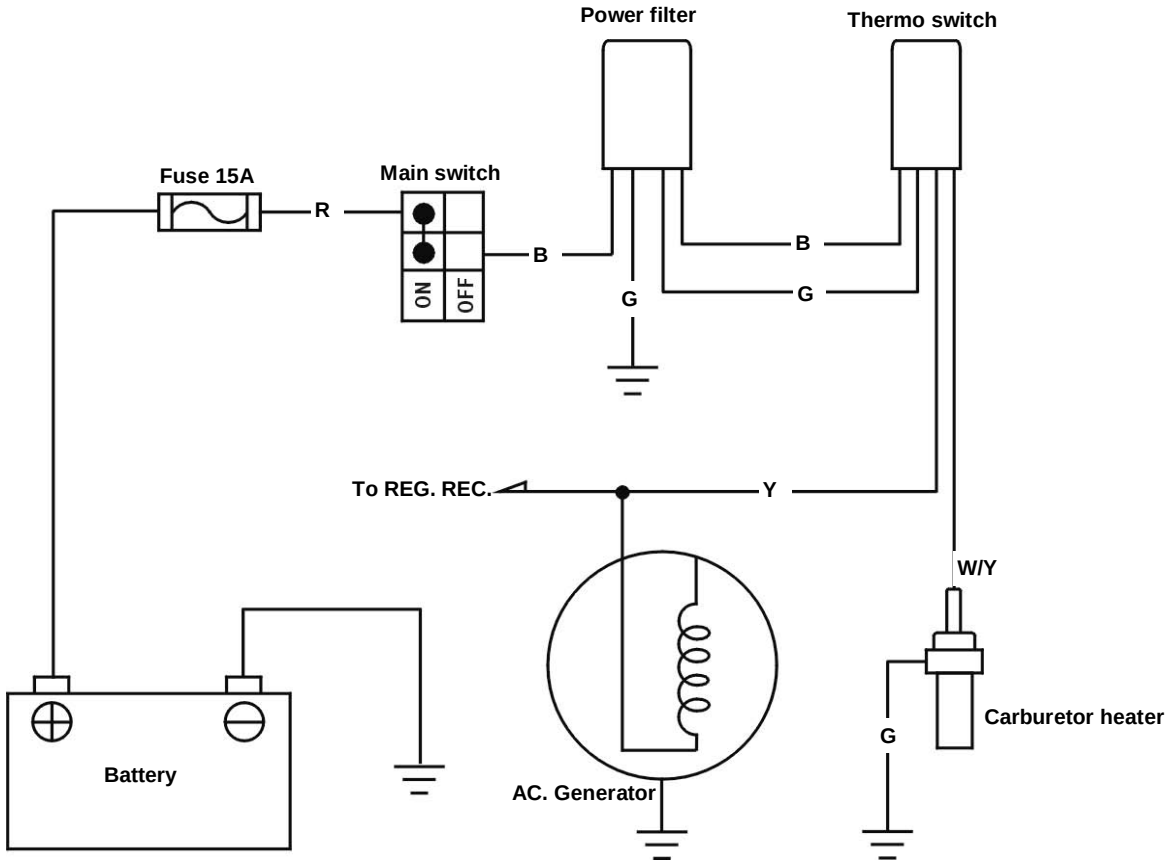






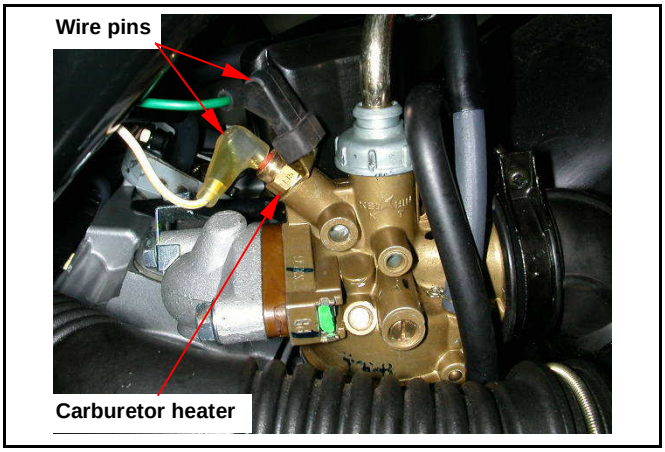


Carburetor Heater

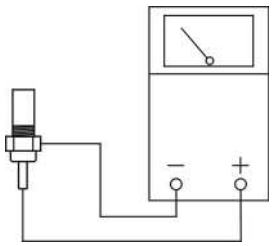


Removal/Installation

Remove luggage box, rear carrier and body cover.
Remove carburetor heater wire pins.
Remove carburetor heater.

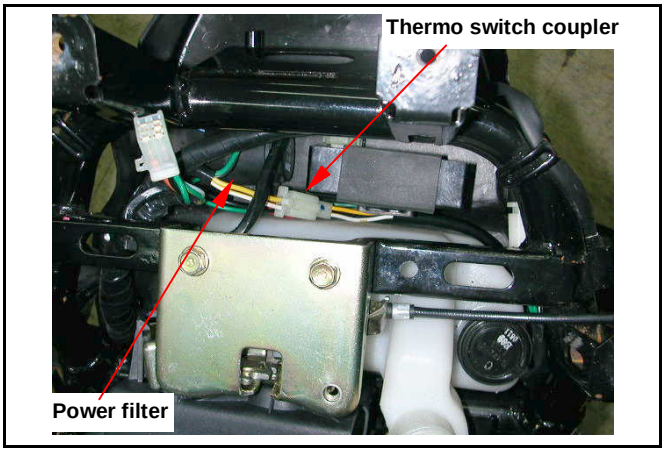


Inspection



Carburetor heater resistance : 7±10% Ω

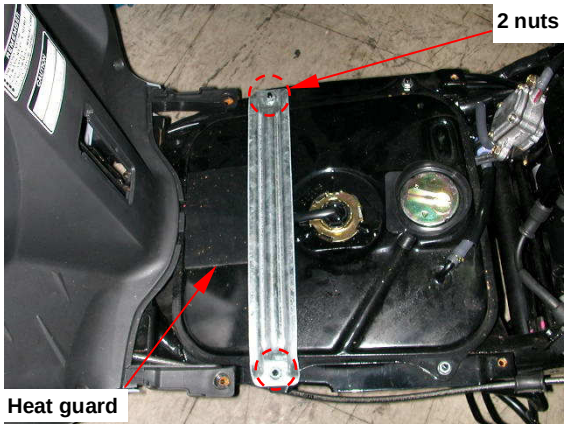
Remove power filter coupler and thermo switch coupler, and then remove power filter and thermo switch.



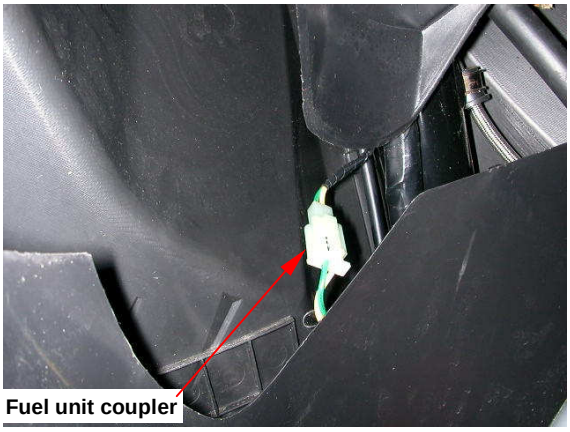
Fuel Unit

Removal/Installation

Remove 4 bolts and floor panel.
Remove floor plate (2 nuts).
Remove fuel tank heat guard.



Disconnect fuel unit coupler from front wheel side.

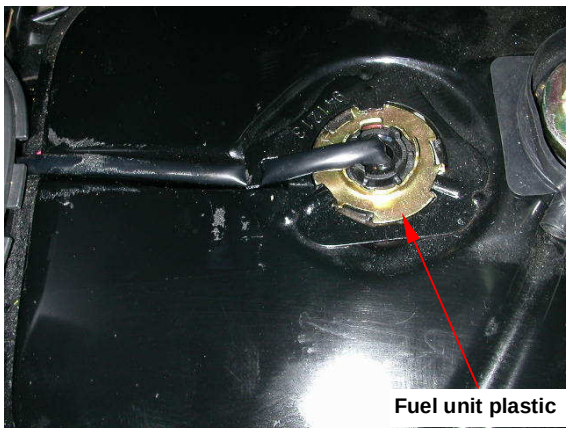


Turns the fuel unit retain plate in counter-clockwise direction and then remove the fuel unit retain plate.
Remove the fuel unit.

⚠ Caution

Do not bend the float arm.

Install in reverse order of removal procedures.
Remark: Aligning the slot of fuel unit with the retain plate of fuel tank as installation, and then turn the retain plate in clockwise direction until matching to the arrow.

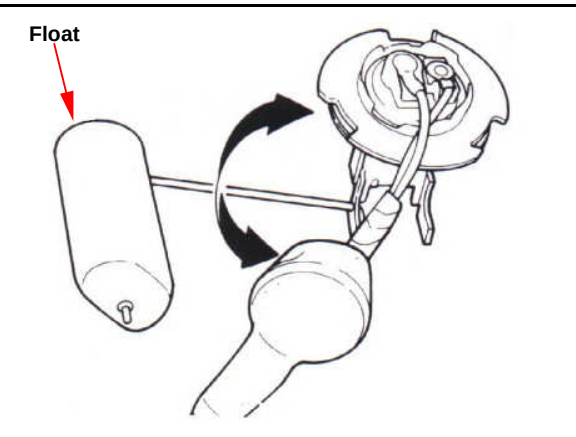


Inspection

1. Connect the fuel unit coupler.
   Turn the main switch ON.
   Move the float in up and down, and make sure that the fuel indicator can be reached to F (Full) and E (Empty) positions.
   Conduct the step 2 if the needle on the fuel indicator is not moved.
2. Measure the coupler resistance while the float in up and down positions.

Float position	Resistance value
Up (full)	3~10Ω
Down (empty)	90~100Ω

Check the fuel indicator if the resistance is in normal.
Replace the fuel gauge if the resistance is abnormal.

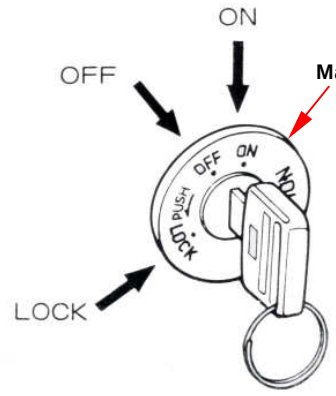


Switch / Horn

Remove handle covers and front cover.
Check continuity on each switch.
The connected circles with a line are that they should be in continuity.

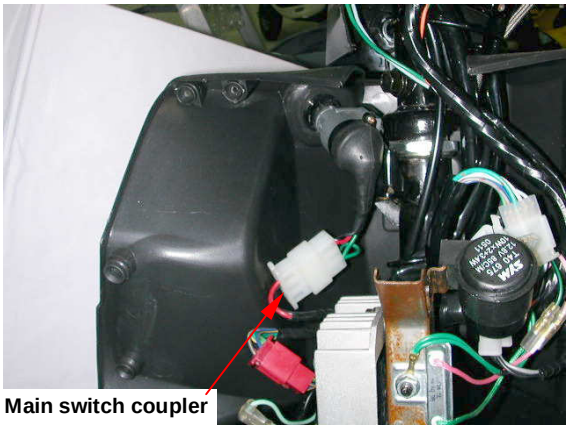
Main Switch

Wire color	Black	Red
LOCK		
OFF		
ON	●	●



Replacement of main switch

Turns the main switch cap in counter-clockwise direction and then remove the main switch cap.
Disconnect the coupler of the main switch and loosen the mounting bolts (2 bolts).
Remove the main switch.
Install the new main switch and tighten the mounting bolts.
Install the main switch coupler and cap.

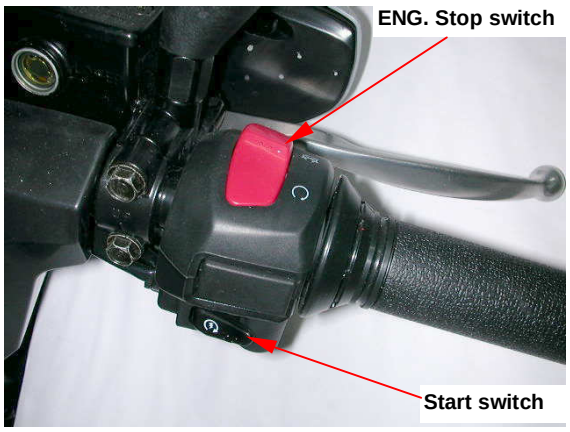


Right handle switch

Remove the front cover.
Disconnect the coupler of right handle switch.
Check the continuity between two points as indicated in the table below.

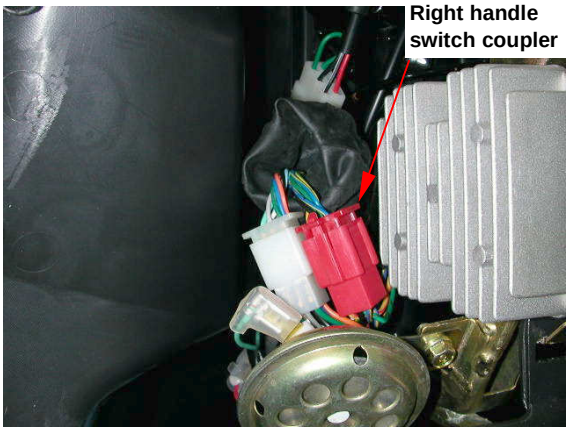
Engine Stop Switch

Wire color	Blue/Yellow	Blue/Yellow
⊠		
◯	●	●



Starter Motor Switch

Wire color	Yellow / Red	Green
FREE		
⚡	●	●



Left handle switch

Remove the front cover.
Disconnect the coupler of left handle switch.
Check the continuity between two points as indicated in the table below

Turn signal light switch

Wire color		Orange	Gray	Sky blue
⇨			●	●
N	FROM R		●	●
	PUSH OFF			
	FROM L	●	●	
⇦		●	●	

Horn Switch

Wire color	Light green	Black
FREE		
	●	●

High/Low Beam switch

Wire color	Black	White	Blue
	●	●	
	●		●

Passing Switch

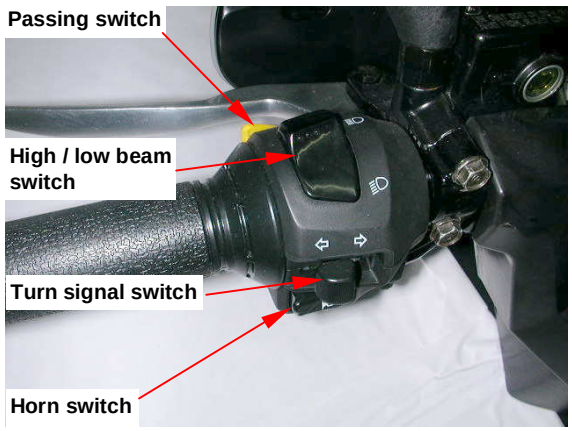
Wire color	Black	Blue
FREE		
PASS	●	●

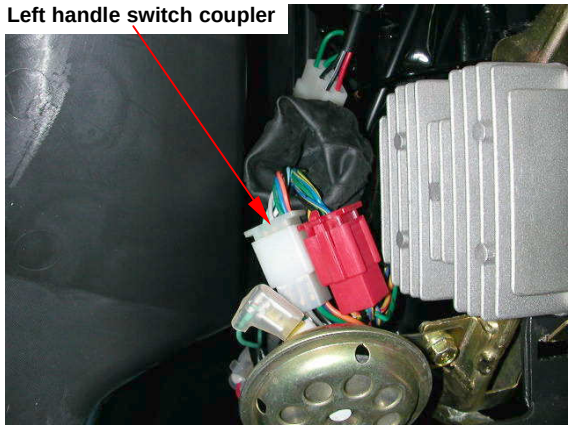
Front / Rear Brake Light Switch

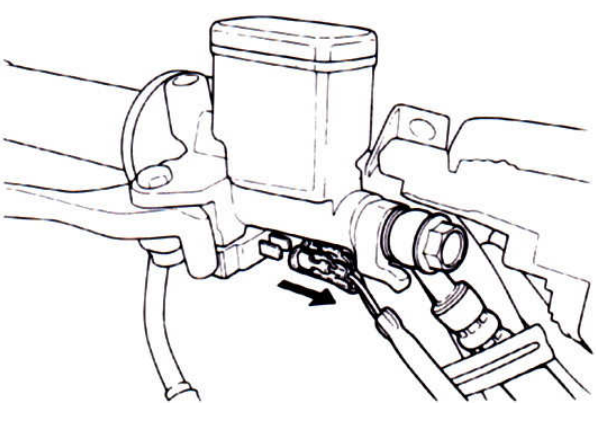
If the switch is in continuity as braking, it is in normal. The switch is non-adjustable.

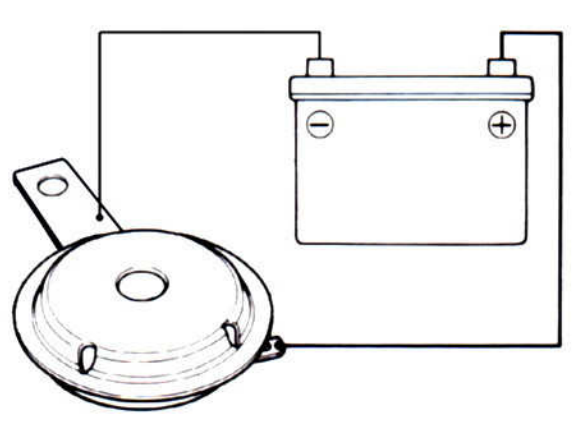
Horn

If the horn gives out sound as connecting to 12V battery, it means that it is in normal.

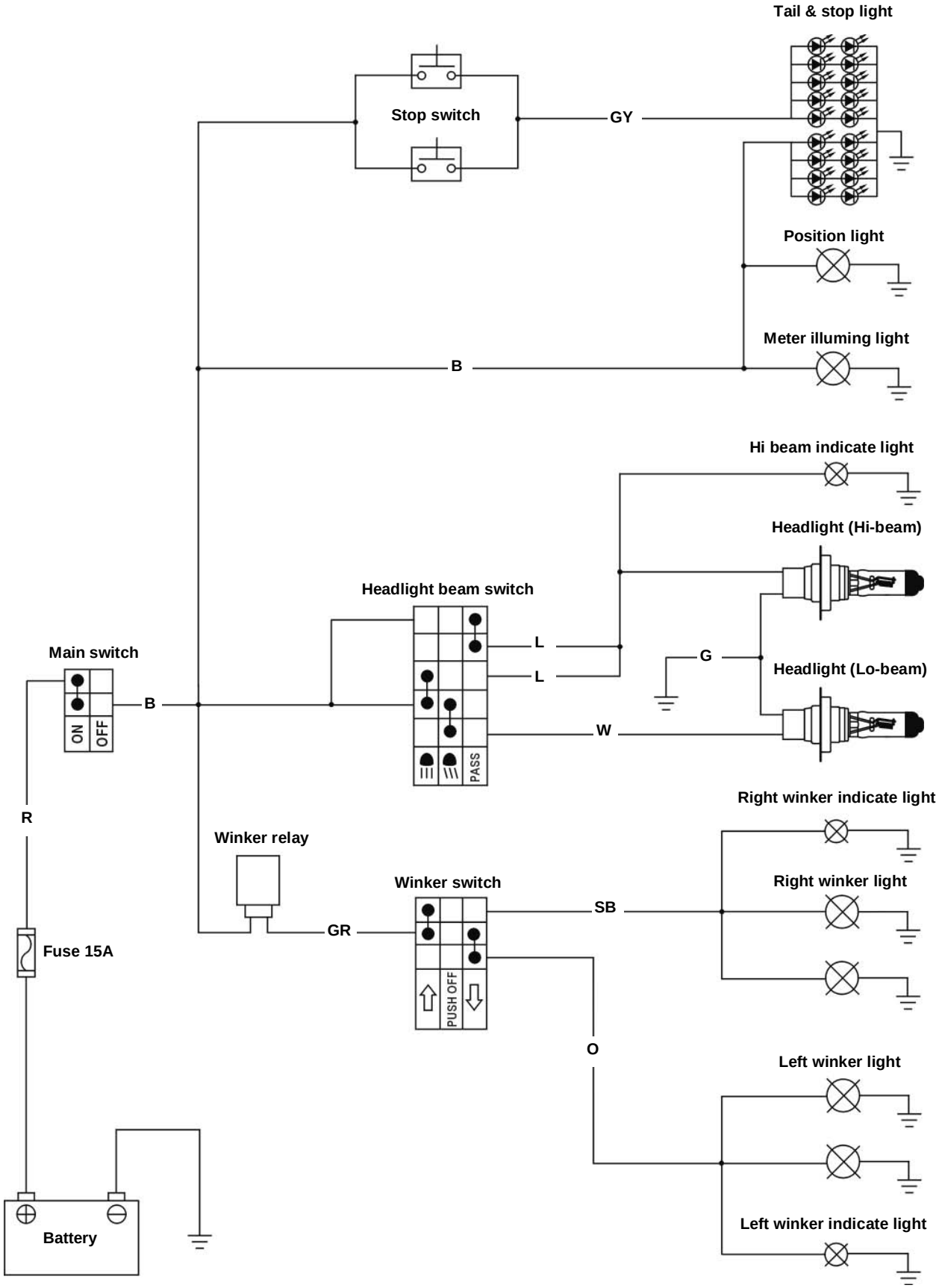








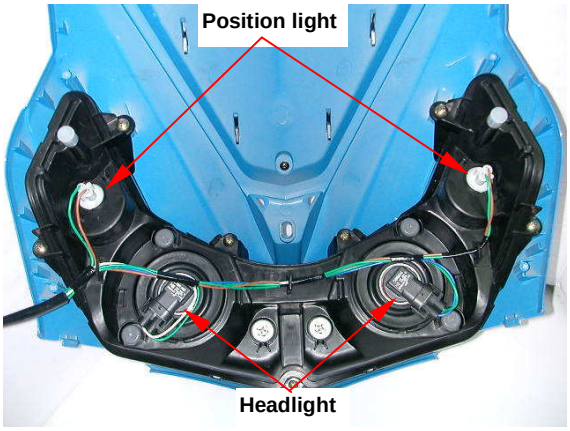
Lights


Tail & stop light
Stop switch
GY
Position light
Meter illuming light
B
Hi beam indicate light
Headlight (Hi-beam)
Headlight beam switch
L
L
G
Headlight (Lo-beam)
Main switch
B
ON
OFF
W
PASS
R
Right winker indicate light
Winker relay
Winker switch
Right winker light
SB
GR
PUSH OFF
O
Fuse 15A
Left winker light
Left winker indicate light
Battery

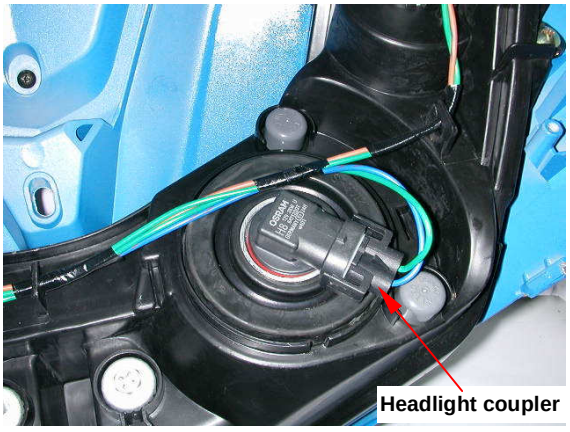
Bulb Replacement

Headlight/position light

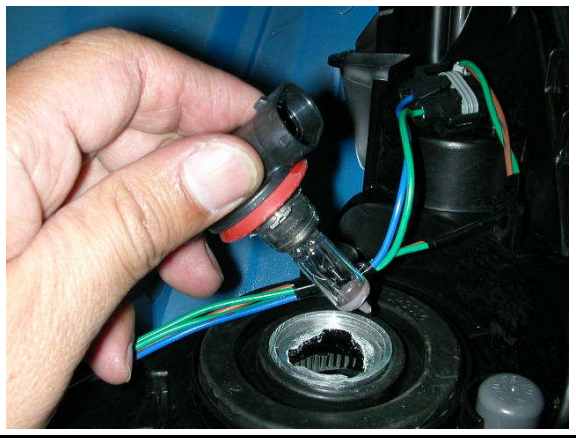
Remove front cover.



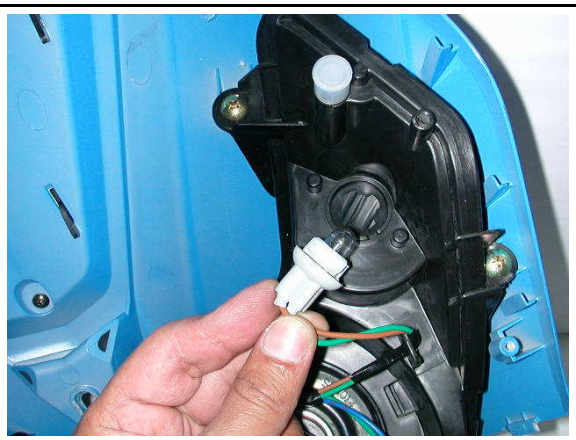
Remove the headlight bulb set coupler.



Turn the set in counter-clockwise direction, and then remove the bulb.
Replace with new bulb if necessary.
Specification:
Headlight bulb 12V 35W (H8)

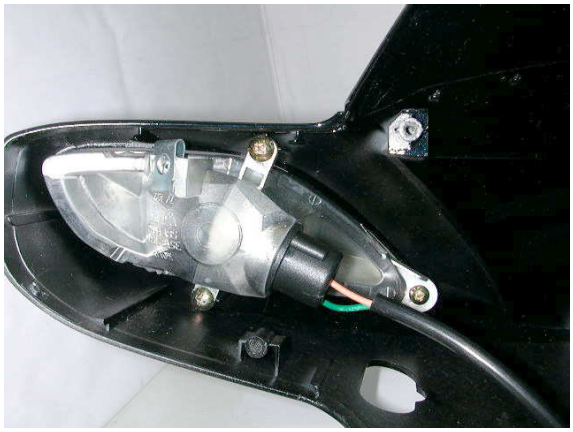


Turn the position light set and then remove the position light bulb seat.
Replace with new bulb if necessary.
Specification:
Position light bulb 12V 5W



Front winker light

Remove 9 screws and then remove handle front cover (refer to chapter 11).
Turn the front winker light set in counter-clockwise direction, and then remove the front winker light bulb seat.



Push and turn the bulb in counter-clockwise direction, and then remove the bulb.
Replace with new bulb if necessary.
Specification:
Winker light bulb 12V 10W

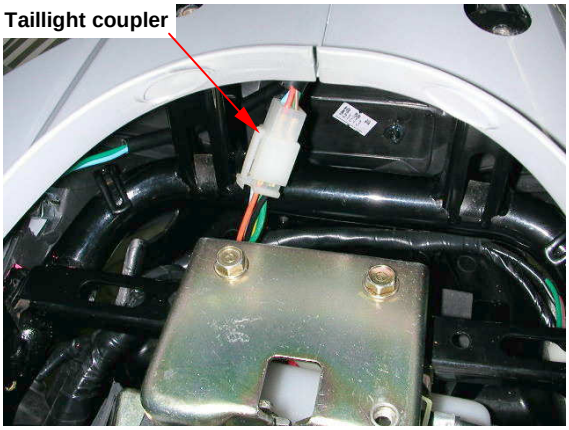
Rear winker light

Remove rear winker lens. (1 screw)

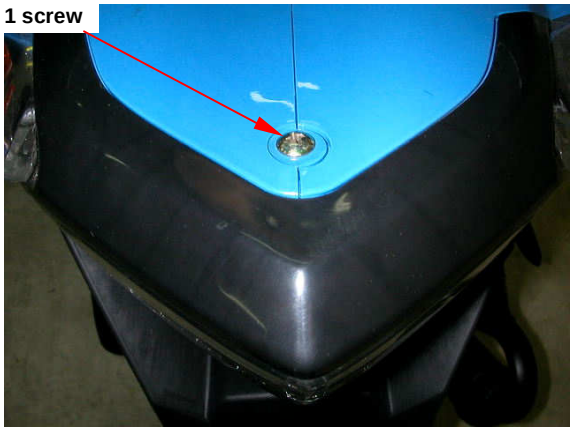
Remove rear winker inner lens. (1 screw)
Push and turn the bulb in counter-clockwise direction, and then remove the bulb.
Replace with new bulb if necessary.
Specification:
Winker light bulb 12V 10W

Tail light / Brake light

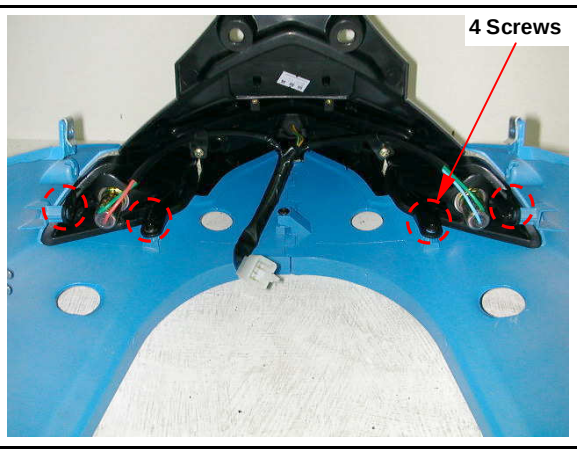
Remove taillight coupler.
Remove body cover, rear carrier, rear fender and taillight assembly.
(Refer chapter 11)



Remove 1 screw from taillight upper side.

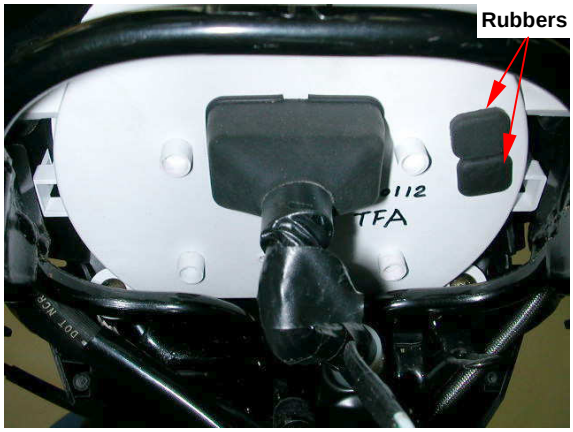


Remove 4 screws and then remove taillight assembly.
Taillight bulb is LED, if necessary to replacement, you must replacement assembly.

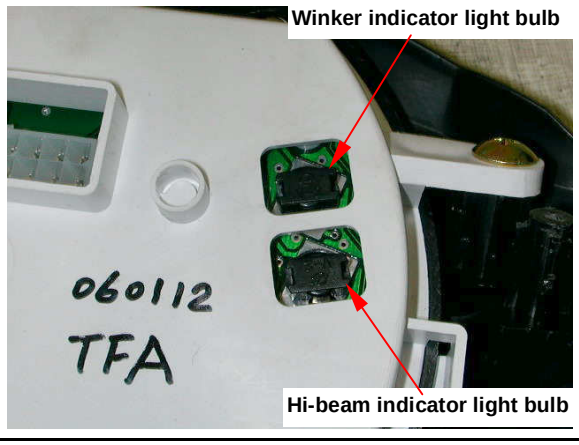


Meter indicator light

Remove steering handle front cover.
Remove winker and hi-beam indicator light rubber.

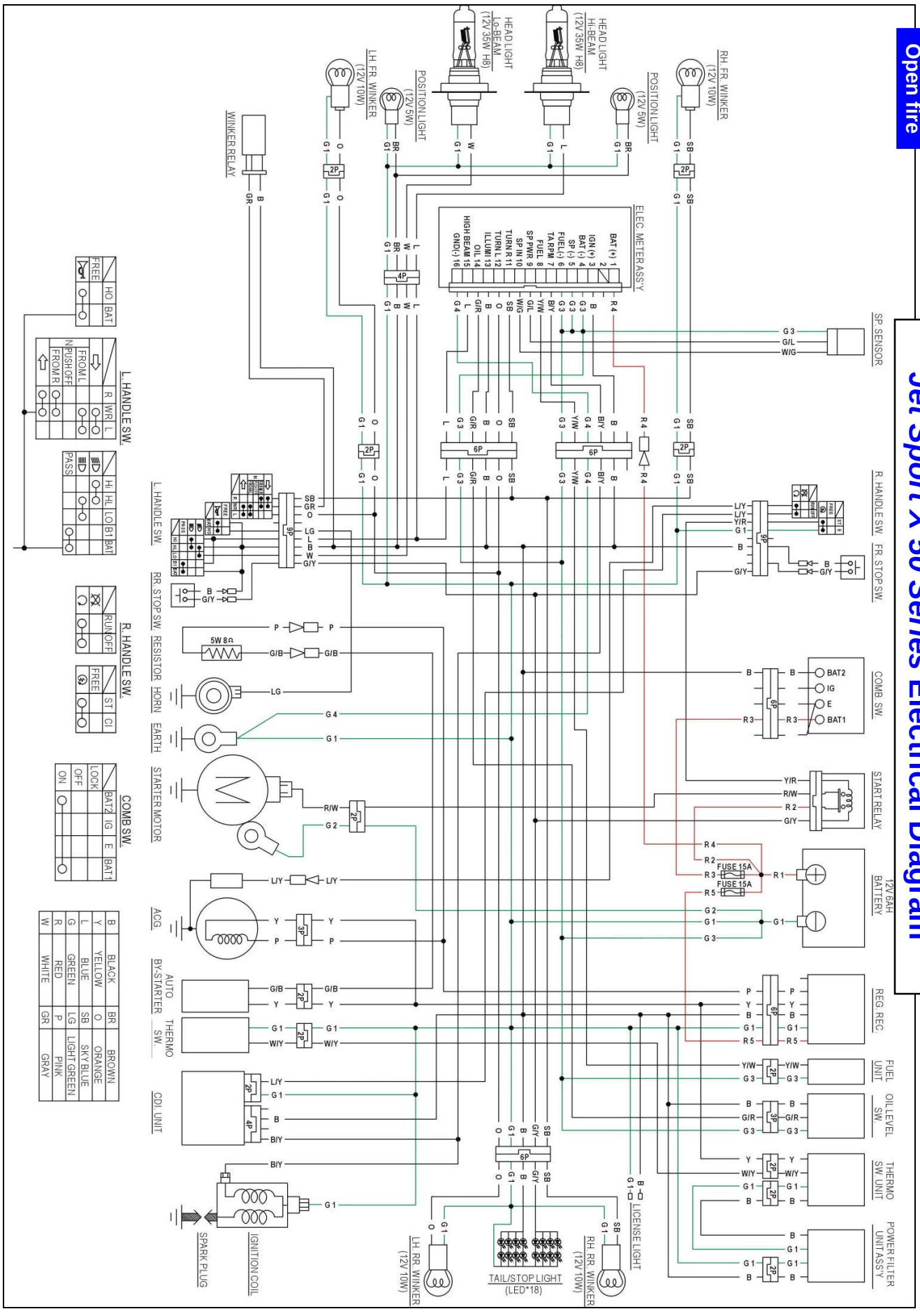


Turn the bulb seat in counter-clockwise direction and then remove, and then take out the bulb seat from the bottom of instrument panel.



Replace with new bulb if necessary.
Specification:
Meter indicator light bulb 12V 3.4W

Install the all removed parts.


Open fire
Jet Sport X 50 Series Electrical Diagram
HEAD LIGHT Lo-BEAM (12V 35W H8)
HEAD LIGHT Hi-BEAM (12V 35W H8)
POSITION LIGHT (12V 5W)
LH. FR. WINKER (12V 10W)
RH. FR. WINKER (12V 10W)
WINKER RELAY
ELEC. METER ASS'Y
SP. SENSOR
L. HANDLE SW.
R. HANDLE SW.
FR. STOP SW.
RR. STOP SW.
RESISTOR
HORN
EARTH
STARTER MOTOR
COMB SW.
START RELAY
12V 6AH BATTERY
FUSE 15A
FUSE 15A
ACG.
AUTO BY-STARTER
THERMO SW.
REG. REC.
FUEL UNIT
OIL LEVEL SW.
THERMO SW. UNIT
POWER FILTER UNIT ASS'Y
CDI UNIT
SPARK PLUG
IGNITION COIL
LH. RR. WINKER (12V 10W)
TAIL/STOP LIGHT (LED*18)
RH. RR. WINKER (12V 10W)
LICENSE LIGHT
BLACK
YELLOW
BLUE
GREEN
RED
WHITE
BROWN
ORANGE
SKY BLUE
LIGHT GREEN
PINK
GRAY

16

16. Electrical Diagram

Notes: